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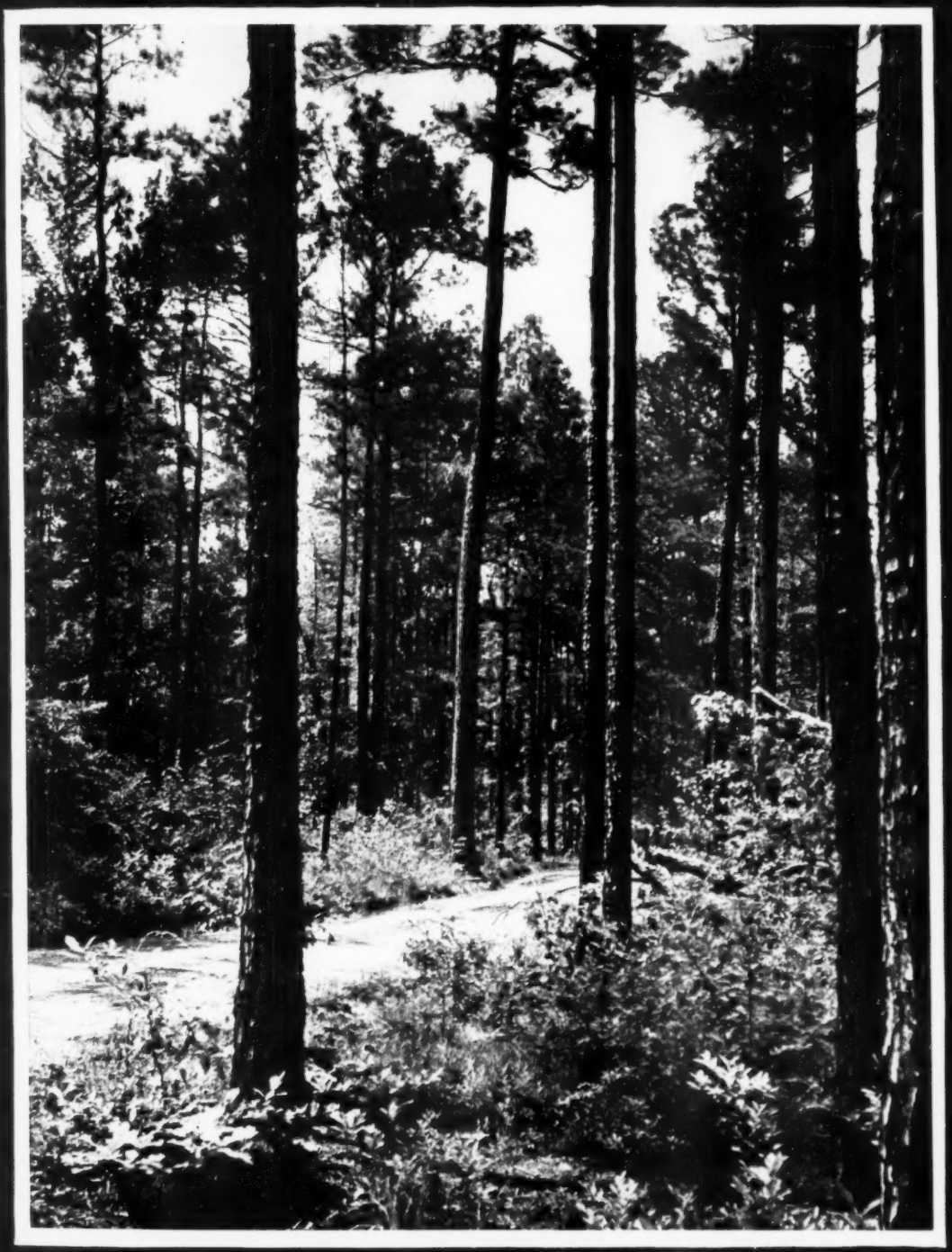

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VOLUME 50 | MAY, 1944 | NUMBER 5

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Photograph by C. R. Lockhard, U. S. Forest Service

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THE
AMERICAN FORESTRY
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The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil. water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

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THE DIXIE CRUSADERS . . .

"WOODS-BURNING," it has been facetiously said, "is one old southern custom nobody wants—not even the South."

"Woods-burning" refers to the annual fires that for more than a century characterized the land and social economy of the southern Piney Woods. It means "setting out" fire to "green up" cattle-grazing woodlands; preserving "health and crops" by killing boll weevil, snakes and ticks; it meant in many instances settling a grudge with a neighbor by "burning him out." There are hundreds of reasons the woods-burner will advance for his actions.

The extent of these burnings, the damage they do and the barrier they raise to successful forest management in the South are eloquently set forth elsewhere in this issue. So are the present-day measures being taken to combat them. But nowhere will be found mention of the Dixie Crusaders, that group of young men who more than a decade ago rolled through the Piney Woods back-country broadcasting, with all the drama of the day, such themes as "Stop Woods Fires!"—"Growing Children Need Growing Trees!"—"Everybody Loses When Timber Burns!"

The fruits of their effort, however, will be found on almost every page—in the growing area now protected from fire, in greatly increased state forestry appropriations, in the advance being made in industrial forestry. For the Dixie Crusaders, the men attached to the Southern Forestry Educational Project of The American Forestry Association, in cooperation with the states of Florida, Georgia, Mississippi and South Carolina, from 1928 to 1931 performed the most intensive and concentrated educational job in the annals of forest fire prevention.

Financed by funds raised by the Association, the especially designed trucks of the Crusaders traveled nearly 300,000 miles to carry their message to 3,000,000 rural people. They gave motion picture shows or lectures in nearly 10,000 schools and distributed more than 2,000,000 pieces of literature.

Under this stimulus, educational efforts in the South moved forward. The states in particular broadened and intensified their programs. The South has not yet conquered the "old southern custom that nobody wants," but it is making good progress in that direction. When this is achieved, the mission of the Dixie Crusaders will have been completed.

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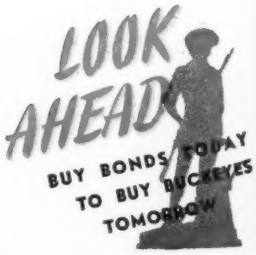

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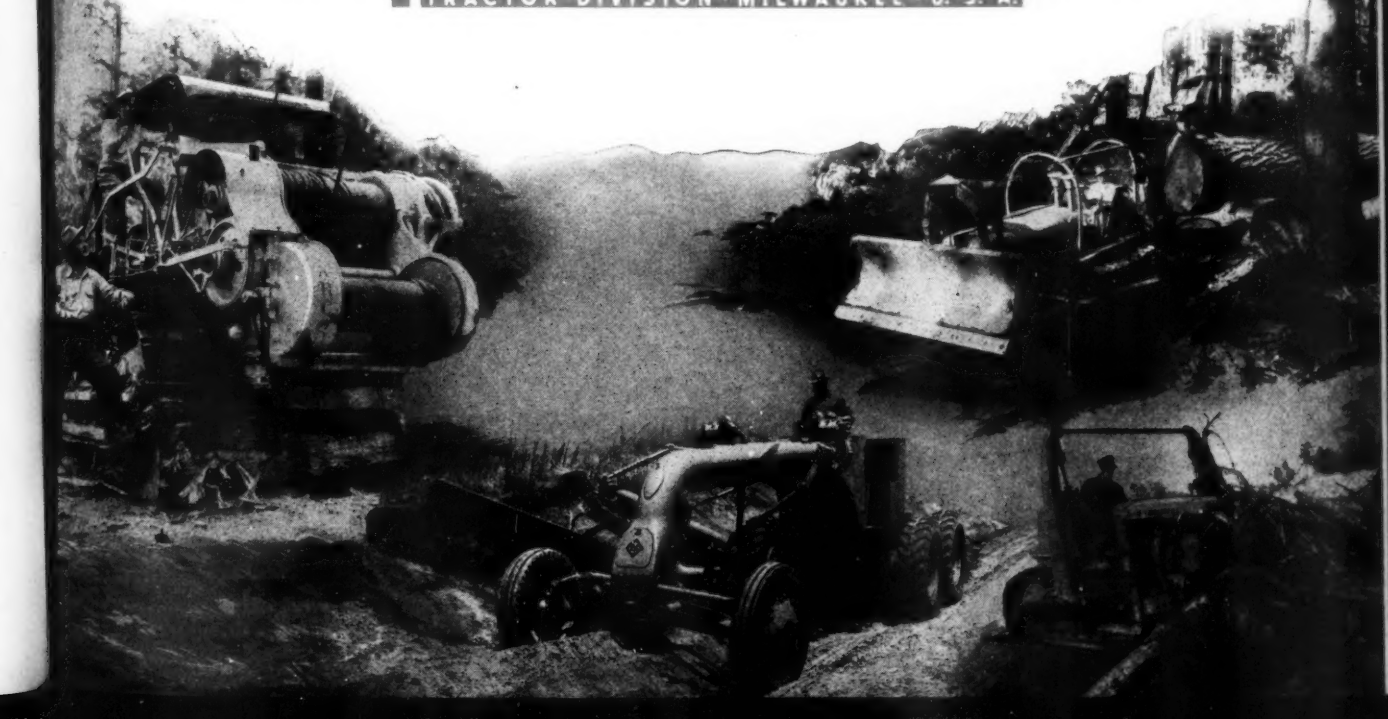

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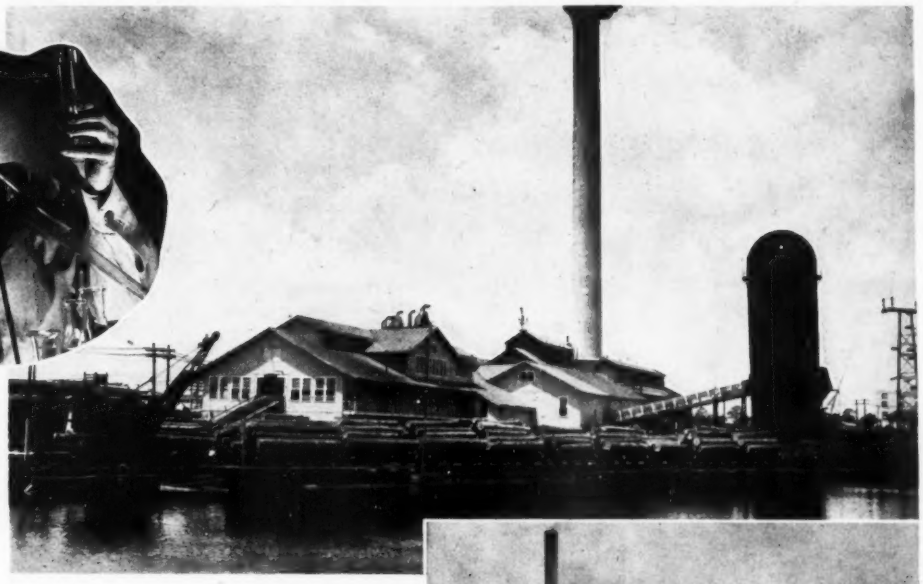

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Specifically, methods embrace selective cutting, leaving seed trees on each acre harvested; effective protection of young forest growth by organized patrols; intensive utilization by augmenting lumber manufacture with paper, pulp, chemical and charcoal production.

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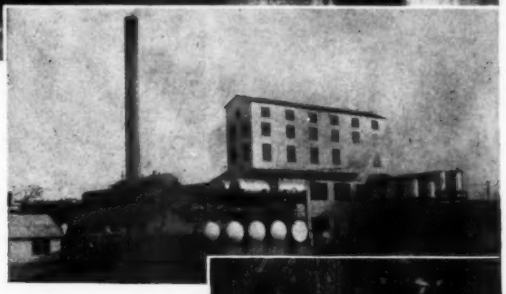

Above: Crossett chemical plant, producing methanol, acetic acid and related wood distillation products.

Right: Under Crossett's forest management program new growth is appearing each year to produce merchantable timber in the years to come.

Below: Crossett Paper Mill, one of the South's largest producers of kraft paper and pulp. Another example of Crossett's intensive program of conservation by utilization

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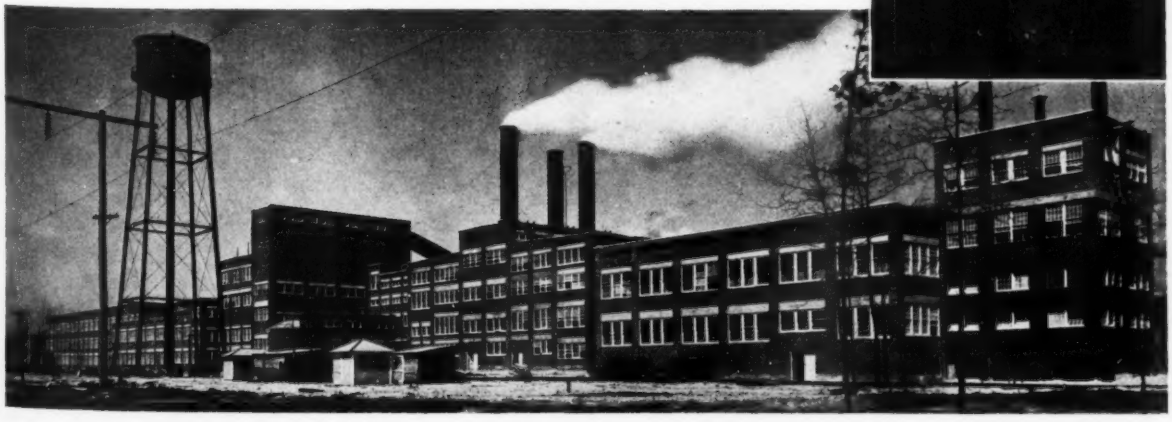
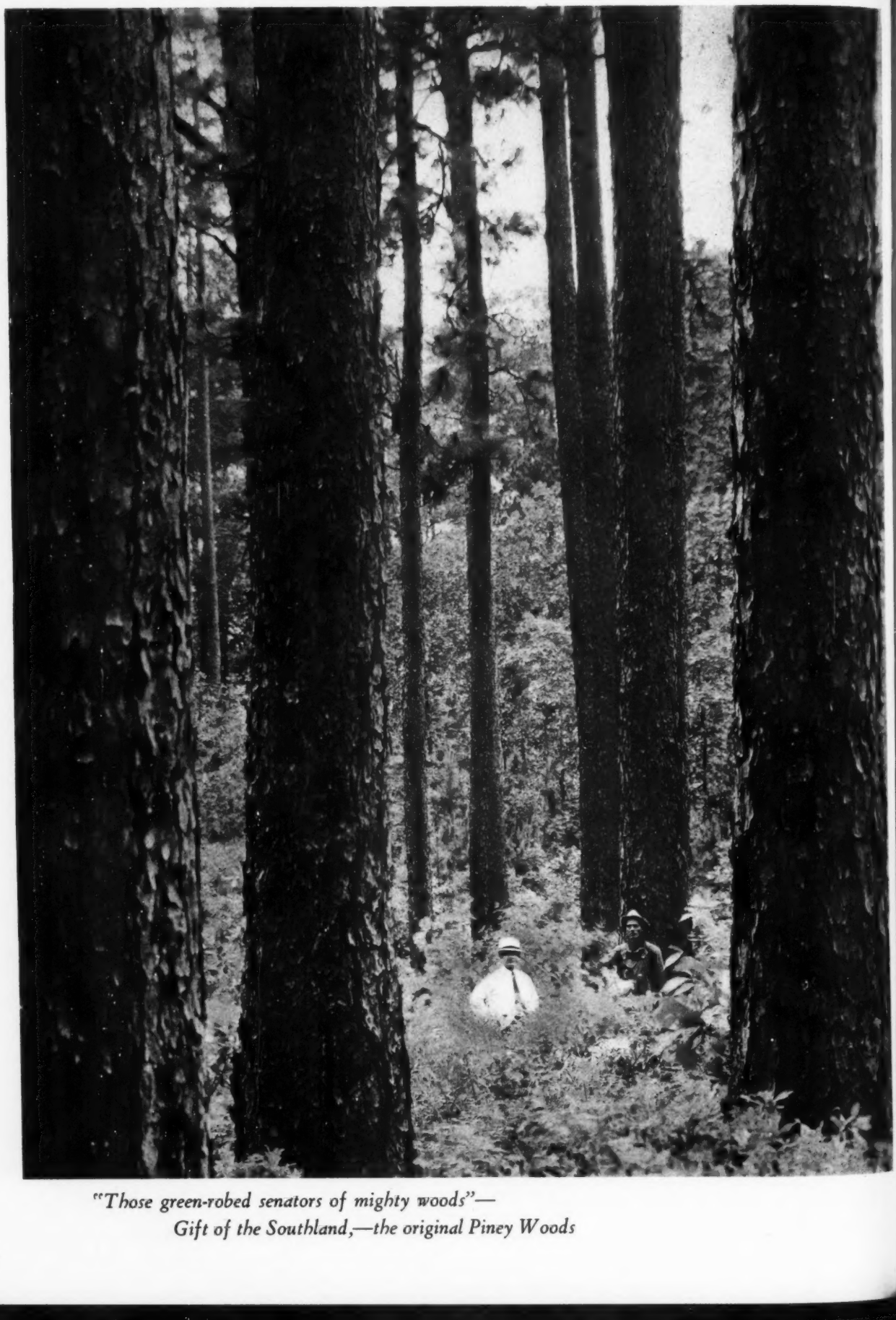




"Those green-robed senators of mighty woods"—
Gift of the Southland,—the original Piney Woods

Editorial

WHICH WAY IN THE PINEY WOODS?

POSSIBLY no forest area in this hemisphere, at least not in modern times, has been the object of so much commentary as the great empire of pine that stretches practically unbroken from the Potomac to the Gulf. Apostles of miracles, attracted by bountiful nature at work under a warm southern sun, have persisted in fantastic prophecies of quick and easy prosperity from every acre of pine-growing land. Uninformed critics, on the other hand, have seen only a land plagued by fire and poverty, by wasteful logging at its worst.

If this makes anything clear, beyond the willingness of many to debate the subject, it is that the southern pineland is a forest of extraordinary possibilities, many of which are as yet undeveloped. To assume, however, that this condition is due wholly to passive interest and ineffective management is to appraise the situation incorrectly. The South has made and is making remarkable progress in bringing its forest empire back from the stump fields of yesterday. That some of its major problems are still unsolved is not so much an indictment of efforts being made as it is a reflection of the magnitude of the job to be done.

To properly appraise this it is necessary to look beyond the effusions of the apostles and the laments of the critics. The Piney Woods is no experimental ground. It is, first of all, the hearthstone of 25,000,000 people, a large proportion of whom depend upon the forest for their daily bread. It is the mainspring of the South's most virile industries — lumber, pulp and paper, naval stores, rayon and plastics, among others. In the national scene its importance is nowhere more graphically recorded than on the production sheets of the War Production Board. Two-fifths of the lumber, one-half of the woodpulp and all of the vital naval stores — turpentine and rosin — required for global warfare are products of the southern pine forests.

After years of intensive logging, grazing and indiscriminate burning, the Piney Woods is able to marshal such great fighting strength primarily because its climate, its soils and its people are inherently woodsy. The fact that long before Pearl Harbor forest management under the stimulus of missionary work on the part of federal and state agencies, and later, by industry, was beginning to take hold in the South cannot be ignored, of course. But the one outstanding characteristic of the southern pine region is that it grows trees remarkably fast, even under adverse conditions.

This ability of the pineland to replenish itself, not once but again and again, would under natural conditions insure its perpetuation in a high state of productivity. But natural conditions began to fade in the South 300 years ago when the forests were first exposed to land hungry plowmen. They vanished almost completely as the last great tracts of virgin timber went down the skidways to the sawmills.

The new conditions that evolved were, for a time, both perplexing and destructive. The pattern of forest land ownership shifted from large holdings to thousands of small ones. One-mule farmers plowed under pine seedlings for corn or cotton, burned diligently and indiscriminately to green up the forest floor for free-ranging scrub cattle. Today nearly three-fourths of the South's commercial timberlands are in ownerships of less than 5,000 acres. With the big timber disappearing, many of the large sawmills folded their tents and moved out, leaving many areas too barren and desolate for even the growing magic of the Piney Woods to restore. This resulted in bankrupt communities, serious tax problems, much unproductive land. It resulted also in the birth of the small sawmill industry to aggravate an already difficult situation. Today around ninety percent of the 17,000 sawmills operating in the South are producing less than 5,000,000 board feet of lumber a year.

As unfavorable as these conditions may appear, one should not conclude that they form an insurmountable barrier to the development of a permanent forest economy in the South. Actually, if properly directed, they may contribute to the achievement of this goal. The small landowner, for example, if made to realize that timber growing is a reasonably profitable business, can be expected not only to adopt good management practices, but also to curb his woods-burning tendencies. With landowners in sufficient number growing trees on a crop basis, the nomadic small sawmill operator would find it profitable to settle down in a permanent location, improve both his capacity and product, and add to the general wealth of the community.

This will not come about, of course, of its own accord. State and federal governments must furnish leadership and some financial aid. The independent forest industries, particularly the big lumber and pulpwood operators, must expand cooperation within their sphere of influence. At the same time, industry must place its own house in order, must put company-owned forest lands under intensive management. This combined effort — industry, landowners and government — can do much toward restoring the Piney Woods to the yield of which it is capable.

Prewar estimates, based on the Forest Survey, indicate that the southern pine forest is stocked with only half the number of trees it can and should support, that annual drain from all sources is about 2,000,000,000 board feet greater than the gross annual volume of growth. Under normal conditions this rate of attrition would not be too alarming, but the tremendous demands for war and the probability of still heavier demands for postwar reconstruction pose a very serious question for southern forest management.

It is by no means insolvable, however. For one thing, the forest industries will enter the reconstruction period under conditions more favorable than most other industries in that they will not be faced with the problem of reconversion. Labor will be plentiful, markets secure. The opportunity thus afforded industry to assume leadership in restoring the privately owned commercial timberlands of the South to full productivity is a great challenge to industrial forestry.

Fortunately, there are forest growers and operators in the South who understand this. How compelling their influence will be in rallying the less enlightened remains to be seen. But of this we may be sure: considering the magnitude of the southern pine area and the many interests involved, what southern industry does with its opportunity will be critically appraised by the people of the South—by the people of the whole nation. It is the forest industry's severest test of leadership—its greatest opportunity.

THIS IS THE PINEY WOODS

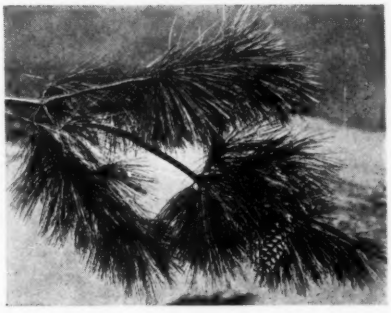
Stretching a Green Canopy from Virginia to Texas, a Young Forest Has Emerged from the Stump Fields of Yesterday to Challenge the Throne of Cotton as King of the Southland

By INMAN F. ELDREDGE

IN MY life span I have witnessed the death and the resurrection of one of the world's great forests, the "Piney Woods" —a forest that stretches its green canopy for 1,200 miles over the greater part of eleven southeastern states from Virginia to Texas. One of my earliest childhood memories in a little South Carolina town is that of seeing, day after day, an apparently endless parade of four-mule wagons hauling great logs of longleaf pine past my father's gate. I didn't realize it then, but I was seeing the passing of an historic forest era. There were logs on those creaking wagons from ancient trees that had witnessed the rout of the patriots under Horatio Gates, hero of Saratoga, by Lord Cornwallis' Redcoats in the war of the Revolution, and eighty years later saw Sherman's triumphant columns marching northward through a dying Confederacy.

During the nearly six decades that have passed since I exchanged gay salutes with the negro teamsters at my father's gate, the paths of my fate have led like a weaver's shuttle through the length and breadth of the Piney Woods. And with better understanding I have seen repeated time and again what I saw as a child in the midde 80's—the last parade of the ancients, the funeral march of a great forest.

But I have experienced another thing, too. I have seen a new forest born—a young Piney Woods to reclothe the desolate stump fields that measured the ruthless appetite of a growing, house-hungry nation, blind in its immaturity to the needs of future generations. I have never gotten over the wonder of that birth, for it was neither sought nor anticipated, nor was it assisted by doctor or midwife. But born it was, and though neglected and mistreated throughout its youth, this stepchild of



Moss-draped coastal pines stand on a carpet of palmetto. Inland (see cover insert) pines often associate with subdued hardwoods

the South is destined to be of even greater significance in the future of the region and the nation than was its ancestor in its time.

The forest that today extends from the Potomac southward to the Everglades of Florida and thence westward to the plains of Texas and Oklahoma, is not and never was a great unbroken body of pure pine woods. It is bordered and veined by hardwood forests of the mountains and river bottomlands. The biggest break in the long southwestward sweep of the pine forest is that interposed by the rich flood plain of the meandering Mississippi, stretching a thousand miles from Illinois to the Gulf of Mexico.

Within its bailiwick, the Piney Woods shares the terrain with fields and pastures, villages and cities, highways, railroads and, more recently, wartime cantonments and air fields. In some sections, particularly in the lower Coastal Plain of the deep South, great pine forests stretch, virtually unbroken, for miles upon end. The total area occupied by pure and mixed pine forest types, according to the latest Forest Survey figures, is around 105,000,000 acres. Within the eleven states, forest stands still cover nearly sixty percent of the land surface, even after 300 years of exposure to the ever-roving eyes of the land-hungry plowman.

There are eight species of pine in the South—longleaf, slash, loblolly, shortleaf, Virginia, pond, sand and spruce pines. Each knows what it likes in the way of soil and climate and while none is picayunish in the matter, it is seldom that more than two or three species are found grouped together on the same ground. Longleaf and slash pines, the aristocrats of the family, are denizens of the deep South, occupying the Coastal Plain from North Carolina to Texas, with slash pine dropping out west of the Mississippi River. The adaptable loblolly pine is found throughout the length of the Piney Woods from the tidewater of Virginia to the post-oak hills of east Texas. It grows cheek and jowl with longleaf and slash in the seaboard "flatwoods" and extends inland to join the shortleaf pine in the upper Coastal Plain and lower Piedmont.

Shortleaf pine also climbs the foothills and lower slopes of the Appalachians, and in the western end of its territory clothes the mountains of Arkansas and eastern Oklahoma. Much less of a traveler, Virginia pine is found mainly in the foothills of the Appalachians from Virginia to Alabama while pond pine prefers the coastal flatwoods where it fringes the edges of tangled pocosins, bays and poorly drained sandy bottoms. The sand and spruce pines are the scrub conifers of the deep South, suitable for pulpwood but for very little else. The former is most prevalent in sandy wastes in Florida. The latter is a modest tree hidden among hardwoods along the lazy water courses of the Gulf Coast.

According to prewar estimates of the Forest Survey, the pine growing stock in the eleven southeastern states included a total of 200,000,000,000 board feet of sawtimber volume. Loblolly pine constituted forty-nine percent of this total, shortleaf twenty-seven percent, longleaf eleven percent, slash seven percent and other pines six percent.

While some parts of the Piney Woods are pure stands of pine species, more frequently a proportion of somewhat subdued hardwoods is found associated with the pine. In the shortleaf and loblolly forests, oaks, hickories, sweet and blackgum, persimmon and many other

Although exposed for 300 years to the ever-roving eyes of land-hungry plowmen, forests still cover nearly sixty percent of the land surface of eleven southeastern states, sharing the terrain with fields and pastures

broad-leaved trees add variety and beauty. Here in early spring the dogwood blooms to gladden the world and to announce to all concerned that black bass are striking in the creeks. In the longleaf-slash pine woods of the deep South, the hardwoods are inclined to be exclusive and draw together in the bottomlands along the streams and in wooded bays, strands and "ponds." Here junglelike woods of cypress, tupelo, blackgum, cottonwood, ash, elm, maple and sweet blossomed magnolia and bay stand with their feet shoemouth deep in warm, brown rain water. Along the lower Atlantic and Gulf coasts, the trees are decorated with streamers of Spanish moss and stand on a carpet of dwarf palmetto. Here, too, is the home of the picturesque live oak which, when fully bedecked with waving moss is a beautiful sight to behold.

The forests of the South have long been one of its main sources of industrial activity. In the eleven states there are about 17,000 operating sawmills, almost equal to the number in all the rest of the country. These for the most part are small mills, run by little proprietors and cutting little logs, but in the aggregate they supply annually approximately forty percent of the nation's lumber. There are forty-five pulpmills in this region which, drawing from nearby pine forests, account for nearly half of all the pulpwood produced in the United States. In the deep South, the longleaf and slash pine stands support the nation's oldest forest business—the naval stores industry. This produces every bit of our turpentine and rosin and, in prewar days, supplied nearly seventy percent of the world market for these products.

The southern pine forest is not virginal and austere like some I have seen, but warm and intimate, part and parcel of every man's livelihood and security. In and around it live and work 25,000,000 people, a good proportion of whom obtain their daily bread from the products of the forest. It is the most intensively used forest in the country. From it flows a constant stream of lumber, poles, cross ties, pulpwood, stave bolts and barrels of amber colored rosin and sparkling spirits of turpentine. Hundreds of thousands of cattle graze under its shade, and the utilitarian successor of the pioneer razorback hog is everywhere.

As we have cut into the Piney Woods it has replenished itself—not once but again and again. On a large part of the area, particularly in Virginia and the Carolinas, the timber stands are made up of third and fourth generation trees since the original forest was cut in colonial days. As a result, the southern pine forest as it exists today is young. Rarely do we find a stand of any extent more than eighty years old, and over a very large part of the region present stands have grown since the turn of the century. Of the 105,000,000 acres in the pine and pine-hardwood forest types, the Forest Survey found that forty-three percent is occupied by second-growth sawtimber, thirty-four percent by sapling stands of cordwood size, six percent is reproduction, nine percent clear cut, and only eight percent is still occupied by the last vestige of original old growth timber.

This, then, is the character of the new forest—the forest with a great future. All that I have said thus far as to its presence and extent is true—but, unfortunately, it is not all of the truth. Viewed from the air or from the window of a fast-moving car, the young pine

stands seem to be worthy scions of the old stock. Critical examination, however, discloses that in the main the woods are thinly stocked with no more than half the number of trees they could and should support. It also reveals that the new stands often are riddled with trees of inferior species, and with diseased and malformed specimens that can never make quality products.

This disconcerting condition must be laid to our ignorance and mismanagement rather than to any failure on the part of nature. We did not harvest the old growth in the first place in such a manner as to insure adequate restocking; and what we did get we failed to weed and nurture. We were so criminally careless with fire as progressively to deplete and degrade our stands; and even now we are cutting immature timber with a profligate disregard of good husbandry. It is all summed up in the phrase we repeat so contritely on Sundays: "We have left undone those things we ought to have done and we have done those things we ought not to have done and there is no health in us."

The anemic condition of the young forest might be accepted without alarm if the South had no greater claim against it than currently to support just the industries, institutions and people now sustained by it. Again referring to the Forest Survey's pre-war figures, the annual commodity drain plus mortality from all forests in the eleven states was some 2,000,000,000 board feet in excess of the gross annual volume growth. This rate of attrition is fairly slow and decades might pass before industry and con-

The Piney Woods is bordered and veined by hardwoods. Cypress and tupelo (above) inhabit the wet bottomlands of the deep South—farther north, a variety of broad-leaved trees (left) mingle with shortleaf and loblolly pines

sumers would feel the pinch of a wood shortage, especially since alert competitors in the light metal and plastic fields are always ready with acceptable substitutes for wood.

But the South cannot afford to be satisfied with the present situation. Since colonial days, it has depended in the main upon the soil for its income. This agrarian economy has its virtues but, somehow, it has held the south at the bottom of the list of those things that make up the fulness of American civilization. It has failed to give the people of the South economic equality with their fellow Americans. To aggravate this situation, southern agriculture, due partly to the alarming decline of the place of American cotton in the world market, is no longer able to employ an adequate proportion of the region's steadily growing, hedged-in population. This explosive combination of an increasing population and a declining opportunity for employment poses a problem the solution of which is of the greatest urgency to the South, as well as to the nation as a whole. Thoughtful southerners believe that a successful solution lies, in large measure, in the fullest possible development of manufacturing industries based upon the processing of finished goods from the raw materials of fields, forests and mines.

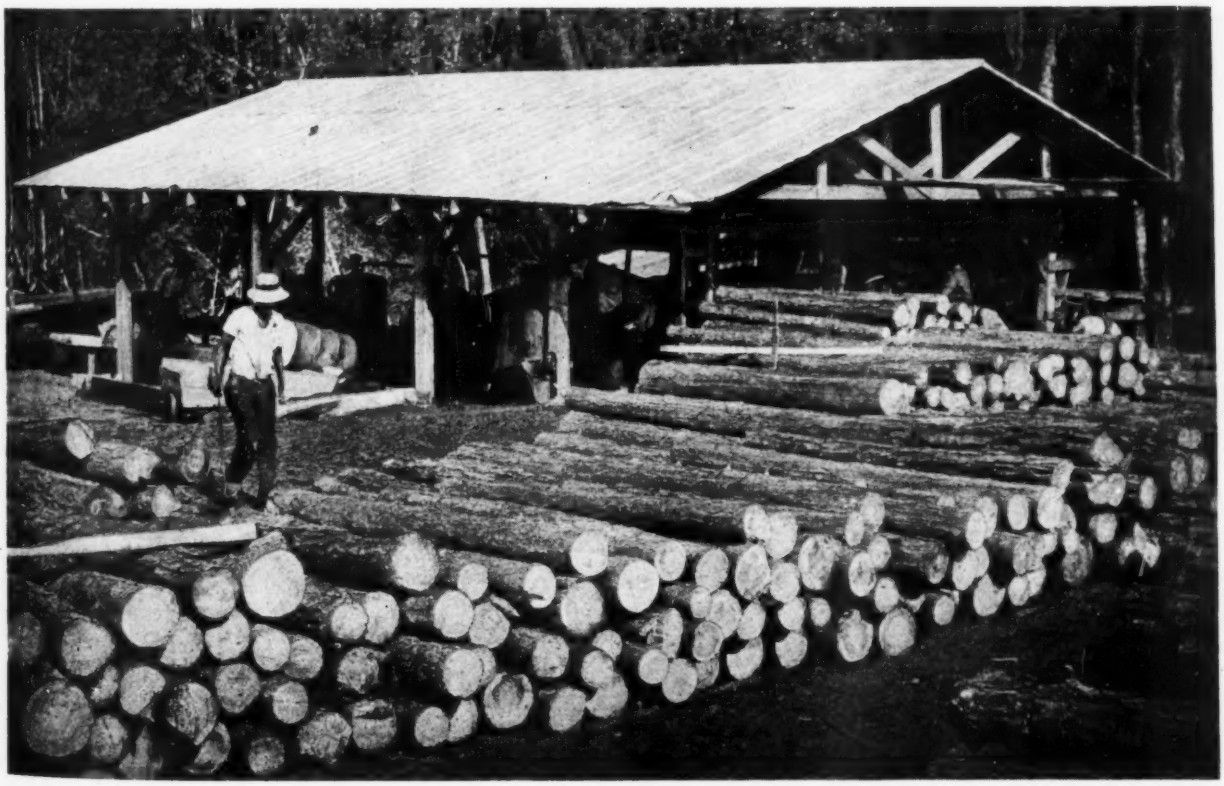
As it exists today, the Piney Woods is young—much of it made up of third and fourth generation trees since the original forest was cut

Among the chief resources of the region upon which such a life-saving program must be based, are its millions of acres of forest land. But, as already set forth, the annual growth of the present growing stock of timber on that land is not adequate permanently to maintain existing industries, much less to justify and support a greatly expanded industry. To play their part in meeting the South's ambition, these forest acres must be made to yield more nearly in accord with their full capacity to grow timber. The Forest Survey found that in general southern forest land can produce at least twice as much as it now does. In the light of the urgent problem that faces it, the South cannot be tolerant of a stewardship that manages sixty percent of a great land resource so indifferently as to produce only a fraction of its potentiality.

It is entirely possible to double forest yields in the pine woods through the application of skilled management. But let us not underestimate the time and effort it will take. To fully achieve the objective will require the successful, sustained following of a widespread program of habilitation on the part of timberland owners from Virginia to Texas. Hundreds of thousands of large and small proprietors must work for years in close cooperation with each other and with the dependent industries. State and federal governments must furnish leadership, encouraging legislation and liberal financial aid. Success, moreover, is contingent upon a universal understanding, such as does not exist today, of the working principles of forestry and their application throughout the region. Even though the task bulks large and formidable, the building up of the forest resource has such an essential part to play in the larger program of regional development that a dynamic South has no alternative but to undertake it.

The South of today has moved far from the South of yesterday in an economic way, and in moving has pointed the path of its destiny. The South of tomorrow will share equally with its sister regions the good things of the American way of living. In its climb to economic parity its forests will play a most important part, and the Piney Woods may one day be crowned King of the South to take over the throne vacated by Old Man Cotton.

Warm and intimate, part and parcel of every man's livelihood and security, the Southern Pine Forest is the most intensely used in the country. In and around it live and work 25,000,000 people, a good proportion of whom obtain their daily bread from the products of the forest. They produce forty percent of our lumber, half of our pulpwood



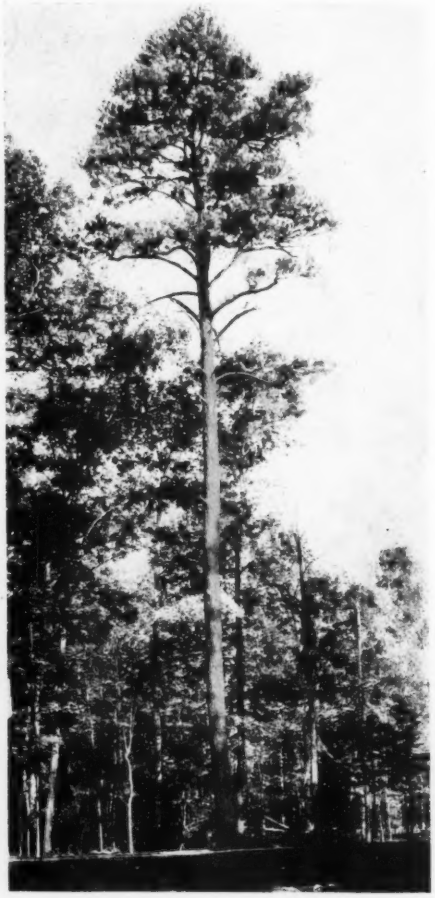
. . . These Are Th

Pictured below are six of the eight species of pine that grow in the South — longleaf, loblolly, pond, Virginia, slash and shortleaf.

Longleaf, aristocrat of the southern pines, as its name implies, is characterized by dark green, flexible needles from eight to eighteen inches long. Its orange-brown bark is papery.

Loblolly, so named because it often grows in moist depressions, or "loblollies," has stiff, pale green, slightly twisted needles. Its bark is cinnamon-red, deeply furrowed.

Shaggy appearing pond pine is relatively small. Its yellow-green needles are slender, dull, slightly twisted—its bark, reddish brown, is broken into thin, angular plates.



Longleaf

Loblolly

Pond

Southern Pines . . .

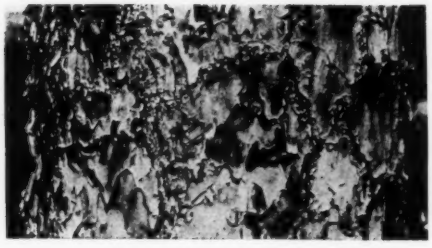
Virginia, frequently called "scrub" pine, is also small, often straggly. Its grayish green needles are sharp pointed—its dark brown bark shallowly furrowed, scaly.

The rapid growing slash pine has dark lustrous green needles, from eight to twelve inches long. Its orange bark consists of many overlapping scales.

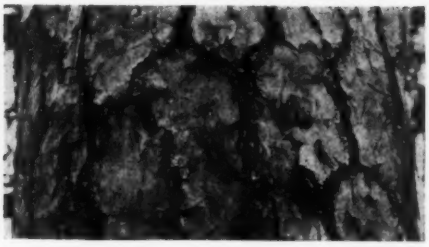
Shortleaf is characterized by its rounded crown and short, bluish green needles, only three to five inches long. Its scaly cinnamon-red bark is broken into irregular plates.

Sand and spruce pines, the remaining two southern pine species, are scrub conifers, of little commercial value.

Virginia



Slash



Shortleaf

PINES AT WAR!

PARADOXICALLY, says J. Philip Boyd, director of WPB's Lumber Products Division, the more successes our armies achieve, the greater is the demand for lumber—more millions of feet to supply additional troops landing overseas, lumber to rebuild captured cities and strong points before they can be used by our fighting men. At Naples, for example, 2,000 carloads of lumber were required in rebuilding the dock area alone.

The same may be said of pulpwood and naval stores which, along with lumber, comprise the mighty weapons of war produced in the southern pine forest. To tell how these fighting pines are meeting increasing demands, AMERICAN FORESTS brings to its readers three outstanding authorities: H. C. Berckes, secretary-manager of the Southern Pine Association; Frank Heyward, Jr., general manager of the Southern Pulpwood Conservation Association; and Harley Langdale, president of the American Turpentine Farmers Association Cooperative.—EDITOR.

Southern pine forests have produced 42,000,000,000 board feet of lumber for the war effort since 1940 — and will turn out their full share of the 35,500,000,000 feet which will be required for the fateful year of 1944.

Nearly half of the woodpulp this country is producing to defeat Hitler and Tojo is coming from the southern Piney Woods. Allied requirements in 1944 approach 24,000,000 cords of pulpwood.

Only the pinelands of the South produce the critical naval stores — turpentine and rosin—so essential to winning the war. The paper industry alone consumed 455,000 drums of rosin in 1942.

LUMBER

By H. C. BERCKES

Billions of feet of southern pine have gone into giant airplane and blimp hangars—into warships, supply vessels, trucks and war housing

IN THE great global war now raging, southern pine lumber is in there fighting. It is fighting on virtually all battlefronts—on land, on the sea and in the air—and also behind the front. Of the 42,000,000,000 board feet produced during the past four years, practically all has been used for war purposes.

Early in 1940, before this country entered the war as a belligerent, the southern pine industry went all-out to provide lumber needed for camps, cantonments and training centers. And it has been fighting for the Allied cause ever since, in the building of shipyards, many types of warships, supply vessels and merchant ships; in trucks and giant hangars; for defense housing.

War Department officials estimate that 300 feet of lumber are required for every man going overseas. This is only the initial supply; more lumber is needed to maintain the fighting man in foreign lands. Southern pine lumber moved overseas with our armed forces —in many cases ahead of them—providing such essentials as camps, hospitals, bridges, first-aid stations, sentry boxes and docks. And it has helped maintain them by packaging war supplies. Billions of feet have been used to crate and box munitions, food and medical supplies. Tanks, airplanes, jeeps and machinery are among the heavier weapons of war shipped in protective crates of southern pine.

Most Allied campaigns during this war have involved amphibious operations, which require that supplies of every kind be packed in substantial boxes made from lumber. This is because cargoes must be unloaded in great haste, usually where there are no docks. Frequently it is necessary to toss the boxed cargoes into the surf where they remain for hours. The lumber boxes protect their contents from damage.

More than 35,500,000,000 feet of lumber will be needed for the nation's war requirements in 1944, according to J. Philip Boyd, director of the WPB Lumber Products Division. Of this, approximately 17,000,000,000 feet will be required for crating and packaging. The remainder will be needed for Army and Navy construction, by the Air Corps, the Maritime Commission, and by railroads, utilities, mining, heavy industries, agriculture and defense housing.

Southern pine lumber has been produced throughout the war period in the face of tremendous difficulties and numerous handicaps, many of which still exist. There is an abundance of Southern Pine timber available; the difficulty has been to procure the manpower and equipment necessary to fell the trees and get them to the sawmills, and to provide the workers needed to manufacture the logs into lumber. The pine industry has sufficient machine capacity, but manpower must be provided to operate the machines. Equipment must be kept in repair, replaced when worn out. Tires, trucks, tractors, cable and saws are essential, as are other supplies required by the industry. In brief, southern pine is an important and essential part of the Allied war machine, and must be given proper opportunity in procurement of manpower and equipment that is necessary to maintain it as a potent fighting force.

The big need now is for crating and boxing to supply our troops

In addition to these difficulties, the industry now is in a transition from the field of large-scale operations into small and widespread producing units, occasioned in part by the character of the timber supply and its accessibility. Large compact tracts of timber have given away to small and scattered tracts.

The changed conditions have added greatly to the difficulties of the southern pine lumber producers in meeting the heavy demand and quick delivery of material for war purposes. However, leaders in the industry feel confident that all difficulties and all handicaps will be overcome and that southern pine lumber will help to deliver the knockout punch of our armed forces when Victory comes.

Southern pine always has been a good, dependable soldier, and there is not the slightest indication that this reputation will be marred in the present terrific conflict.

PULPWOOD

By FRANK HEYWARD, JR.

Most pressing pulpwood problem is transportation. With more trucks and manpower, mills could increase production fifteen percent

WHEN the first commercial run of sulphate pulp was made at Roanoke Rapids, North Carolina, in 1909, little did the men in charge of the operation realize that their product was destined to be of great importance to the nation in the present world conflict. Technological developments and originality have increased the uses of kraft paper a thousandfold since the earliest wrapping paper was produced. Multiwall sacks, smokeless powder, supply parachutes, shell cases, bomb fins, and board used in producing containers are only a few of the articles highly essential to the war effort made from sulphate pulp.

Not all pulpmills in the South produce sulphate pulp, although by far the largest percentage of the total pulp manufactured is of this type. One mill produces sulphite pulp for making rayon. Another produces newsprint. Most of the remainder manufacture wall board. However, all these products are urgently needed for war use. A special type of wall board insulates the interior of tanks and also the interior of metal huts used by our armed forces in cold climates. Sleeve targets for aerial gunnery practice and human parachutes are made from rayon. Nearly fifty percent of the wood pulp produced in the nation comes from southern mills.

In spite of the great need for wood pulp today, the southern industry is running considerably under full capacity. This is due to a shortage of pulpwood. There is no dearth of stumpage. The vast forests of the region have adequate volume to stand the present drain for many years.

The pressing problem facing the industry is transportation. Practically all southern pulpwood is moved part of the distance from forest to mill by truck. The truck shortage which confronted the industry at the first of the year was critical, although some relief has been provided during the past two months. The labor shortage is almost as critical, with no relief yet in sight. Locally, inadequate freight cars have constituted a grave bottleneck. In spite of these and other difficulties, however, southern production in 1943 was only slightly more than two percent under 1942. This fact was highly important because production in other sections of the country fell off sharply in 1943, due to problems even more serious than those which occurred in the South.

The current demand for pulpwood has raised the question as to whether the pulpwood industry is endangering the South's forests through overcutting. The answer is an unequivocal "no." Demand for a commodity is one thing, the quantity produced quite another. The industry could probably use between fifteen and twenty percent more pulpwood than is being produced.

It should be borne in mind that pulpwood consumption and drain on the growing stock are in no way synonymous. To begin with, a significant percentage of the total volume of wood consumed is derived from thinnings and improvement cuttings. Although the industry itself, through its Southern Pulpwood Conservation Association, is too short of manpower to continue its intensive prewar program of timber marking, an integral part of its general forestry program, public forestry agencies have stepped into the picture. Then foresters are marking for improvement cutting and thinning many privately owned stands of timber. Lastly, an important source of pulpwood continues to be from areas clear cut for the establishment of permanent pastures, a practice aggressively pushed by the A A A.

There is no question but that there has been a definite let-down in the standard of pulpwood harvesting methods of prewar days. This was inevitable. Foresters formerly employed for conservation work on non-company lands are now either in the armed forces or engaged in wood procurement. Also Southern Pulpwood Conservation Association timber cutting demonstrations have been discontinued because of personnel shortages and travel difficulties.

The pulp and paper industry looks to the future in the South with keen anticipation. The industry is now established on a permanent basis. Its executives realize clearly that destructive harvesting methods are outmoded — that a permanent pulp and paper industry must be based on a permanent, stabilized wood supply. This they mean to have by virtue of up-to-date forest management on their own lands and by actively encouraging good forest practices on non-company lands.

Insulation of tanks is but one of many war jobs of wood pulp

NAVAL STORES

By HARLEY LANGDALE

Drums by the thousands—naval stores for paper products, for protective coatings, for practically all items that go to war

DURING the long years since steam swept the clippers from the seas, "naval stores" as a designation for turpentine and rosin has been regarded as a misnomer. Now, however, they are "naval stores" again—and "army stores," too! Not, of course, in their old function of caulking seams in windjammers, but they have gone to war, on land and sea.

Turpentine and rosin have gone to the front wearing many different "uniforms." Some we know and recognize; others, from considerations of security, we are not allowed to know. But the importance of the roles they play, known or unknown, is attested in many ways.

Both the Selective Service and the War Manpower Commission have listed the production of gum naval stores as "an essential activity." Essential, that means, to the waging of a successful war. Not only has the War Production Board granted the highest priorities for obtaining necessary materials to those engaged in the turpentine and rosin industry, but it has, also, through the medium of the Commodity Credit Corporation, set out to accumulate substantial stockpiles of gum naval stores.

U. S. Forest Service, through TPWP, is conducting an aggressive campaign to stimulate turpentine and rosin production—and, incidentally, is doing a magnificent job in boosting labor morale, in cutting reams of red tape, and in speeding up delivery of trucks, tires, tools and other items to producers. And last, but far from least, the Navy has become one of the largest consumers of gum rosin in the world.

To that enumeration of straws in the wind many others could be added. All, however, point in the same direction: Uncle Sam has enlisted turpentine and rosin for the duration. Here are a few of the specific jobs that naval stores are being called on to perform:

Southern pines keep the Allies supplied with turpentine and rosin

Rosin is the basic ingredient of "paper size," the foundation of nearly every paper product. Even in 1942, before our war production machine really hit its stride, the paper products industries consumed 455,000 drums of rosin. That's enough to rosin every fiddle bow in the world from now till eternity!

It is in the so-called protective coatings field that rosin is really preeminent. The general term includes paints, varnishes, lacquers, "dopes," fabric coatings, linoleum, synthetic resins, and related materials. To enumerate their uses in the war would be to catalogue the items that go to war. It would hardly be too much to say that "If it has paint on it, it has rosin in it."

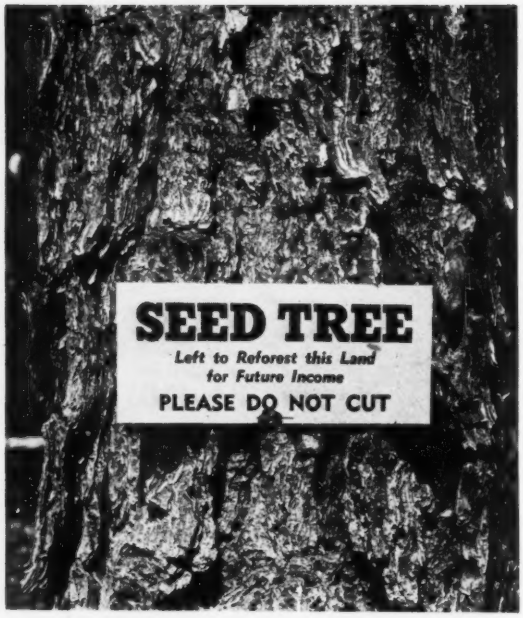
While bitterly resenting its classification as a "substitute," producers of rosin are proud to point out that it is now taking the place of many materials formerly imported from combat areas, such as Pontatianack and Kauri fossil gums, damar, copra, palm oils, and other vegetable oils. The vegetable oils were imported for use in the manufacture of soap. To take their place, the soap industry estimated its 1943 rosin requirements at 750,000 drums, as against previous annual requirements of only 250,000 drums. And the fact that soldiers can neither eat soap nor shoot it doesn't take it off the essential list.

Turpentine is, of course, the nation's number one paint thinner. Its importance in the protective coatings field ranks, then, along with rosin. Some of its less known uses are in the manufacture of synthetic camphor and synthetic rubber; in insecticides and pharmaceuticals; in plastics; and, some say, in flame throwers.

Smaller-quantity uses of naval stores could be prolonged into a tiresome list beginning with adhesives, asphalt products and printing ink. Users include abattoirs, foundries, railroads, shipyards and rope manufacturers. Rosin is used, I know, in shoes and ships, and maybe in ceiling wax. It is not recommended for cabbages; but the King of England received 112,000,000 pounds from April, 1941, to October, 1942, under our lend lease program.

I do not know how long naval stores have been going to war. Fable has it that in the days of ancient siegecraft, besieging armies were wont to catapult balls of flaming tar and pitch into a beleaguered town. Be that as it may, I do have it on reliable authority that, "since fighting days of old," naval stores, in many guises, have fought our country's battles on land and on sea.

Those of us who have even a small part in their production are proud that they are doing an even greater job in this, the greatest of all wars.



Challenge, and Opportunity, for Industrial Forestry

By G. H. COLLINGWOOD

Although geared to war and heavy cutting, the southern pine industry, says the author, is fully convinced that one of the foundations for future prosperity in the South is well managed forests

FOREST industries in the great southern pine region are geared to global war. In the face of tremendous difficulties, they will produce around forty percent of the more than 35,000,000,000 board feet of lumber needed this year to sustain our expanding drives against Nazis and Japs. They will supply probably half of the wood pulp and all of the naval stores for both the fighting and home fronts.

Forest operators everywhere share the handicaps of manpower and equipment shortages. But the South contains a combination of circumstances peculiar to itself and which must be considered in any long-range view of forestry in the Piney Woods. These include woods-burning, a pattern of many forest land ownerships and thousands of small roving sawmills.

But the superb achievements of the South in our war emergency, its demonstrated ability to supply war requirements, are evidence of substantial progress being made in southern forest management. The wood is there in great abundance not alone because climate and soil favor tree growth, but because conservation work of many decades has fulfilled its promises and is now bearing fruit.

The challenge to private industry is to bring timber producing lands to full service. This means fire protection, cutting practices that stimulate capacity growth in young forests

Outstanding in any consideration of the South as one of the dominant forest regions of the nation is the fact that this production is based chiefly upon second and third growth. Because the original timber stands were being cut away, reports spread broadcast that the southern lumber industry was on the brink of exhaustion of its resource. As far back as 1920, when the South was producing nearly half of the nation's lumber needs, before pulpwood production was a factor, and while fire was burning unchallenged in the wake of loggers moving into great tracts of longleaf and loblolly pine, the Senate Select Committee on Forestry was alarmed to the extent of predicting southern pine lumber would be through in fifteen to twenty years. Other reports, even including one prepared by the Southern Pine Association, were equally pessimistic.

These fears were born during the heyday of big timber, large forest owner-

ships, and sawmill capacities of tremendously high production. They resulted from a line of thinking that could see nothing but the approaching end of so-called virgin stands. It seemed plain that the pattern of the industry existing then could not be followed forever, but it was not equally as obvious that a new set of conditions, properly gauged to the growing capacity of the land and intelligently planned and applied, could create a forest industry that would be permanent.

Only a few could grasp the potentialities of this idea when it was first advanced and were willing to invest in the future it promised. But these few did establish industrial forestry in the Piney Woods.

At the outbreak of war, this transition from exploitation of old growth timber to utilization of second and third growth trees was nearing completion. In consequence, more and more large operators recognized that their future depended not upon "reserve" stands, but upon volume of future growth. They launched management plans, not only for their own holdings, but also in cooperation with small forest landowners from whom they obtained an important supplementary supply of timber. They were not many, but they had made the beginning, and their example is transforming industrial forestry from the status of risky, visionary hope—to that of good business.

To say that is not to say the problem is solved. Nearly half of the South's forest land is still without organized fire protection, and a third of this unprotected land is owned and operated as industrial forest property. This lack of protection on millions of acres throughout the South is doubly dangerous, for we still can see the tragic consequences of uncontrolled annual burning by thousands of small landowners whose only interest is to clear land for indifferent crops or burn the woods — anybody's woods—to obtain a bit of temporary forage for cattle.

There are other problems, making for uncertainty. Taxation is one. Frequently, it is not conducive to long-term business. Frequently, too, it has not provided adequate funds for protection, particularly in view of the multiple ownerships so characteristic of the region. Of significance here is the resolution recently submitted by a group of timberland owners and sawmill operators in Alabama, recommending to their governor a severance tax on all forest products, the income from which would be devoted to fire protection of all forest lands in the state. A suggested tax of twenty-five cents a thousand board feet on pine sawlogs and fifteen cents a cord on pulpwood would, it has been estimated, provide $1,000,000 annually, four times the present budget. This would be equivalent to about five cents for every forested acre in the state.

Another problem has been a market for trees not suitable for sawlogs. This becomes more pressing as the volume of sawlogs an acre diminishes. It is particularly important from the standpoint of industrial forestry, for without such a market much of the incentive for long-range programs is lacking.

Thus it is that the advent of pulp and paper mills, chaining through the Coastal Plain from northern Virginia to east Texas, fits into the picture of integrated utilization, which is the foundation of successful industrial forest management.

Piney Woods logger

The grinding jaws of these mills can be fed with small dimension stock—pines from four to eight inches in diameter, or from twenty to thirty years old. In fact, trees eleven or twelve years old from seed are sometimes profitably harvested. This has served to stimulate tree farming on the part of small, as well as large landowners, as it provides cash returns from thinnings and undesirable trees while a more profitable sawlog crop is growing to maturity.

Like the end of the big timber era, the advent of pulp and paper mills in the South brought dire prophecies. The region was doomed. Only the most optimistic would believe that forest growth, amazingly fast as it is in the Piney Woods, could supply enough pulpwood to satisfy the huge demands of these mills. To the surprise and increasing satisfaction of farmers and other landowners, young pine has assumed a value. Cotton is no longer the only king and the little pine trees are the Cinderellas whose charms are now being recognized. This new appreciation of the value of pine trees coming as it does upon years of intensive educational work is remoulding public thought in the South.

It must be remembered, however, that sawlogs still comprise the bulk of forest products in the Piney Woods. The same trees that make pulpwood, if given the chance, will grow and produce sawlogs. In fact, both can be grown on the same tract, and pulpwood harvests can be planned so as to leave selected trees for future lumber, dock pilings, or telephone poles. Most significant of all, the removal of pulpwood trees will stimulate the growth of the residual stand left for bigger and more profitable products.

This is the challenge to southern industry—to bring the timber-producing lands in private ownership to full service both for the people of the South and for the nation. Climate, soils, and customs of the region being what they are, this will entail first, adequate fire protection and second, cutting practices that will enable the young forests to add the volume of growth of which they are capable.

These problems and others have been under attack from many quarters. State forest organizations, state extension foresters, the regional office of the United States Forest Service, and many citizen-sponsored groups, such as The American Forestry Association, have all been working for the common goal of region-wide protection of forest land from fire. The most recent action to this end is the program of the Southern Pine Association to obtain statewide fire protection of all lands throughout the South regardless of ownerships.

It cannot be said yet that the number of uncontrolled fires has been materially reduced. But they have been confined more and more to restricted areas, and the number of acres burned over annually has been cut. Programs of education have made progress. But the greatest step will have been taken when it is generally recognized that fire protection and good forest practices actually pay.

Under the requirements of war, some areas in the South are being overcut. It is also true that some operators and landowners for various reasons still follow the old pattern of clear-cutting. On the whole, however, the southern pine industry has come to the conviction that one of the foundations for increasing prosperity in the South is to be found in well-managed forests.

Recent reports prepared in coopera-

(*Turn to page* 254)

UNCLE SAM IN THE PINEY WOODS

What He is Doing and How He Views Southern Forest Possibilities

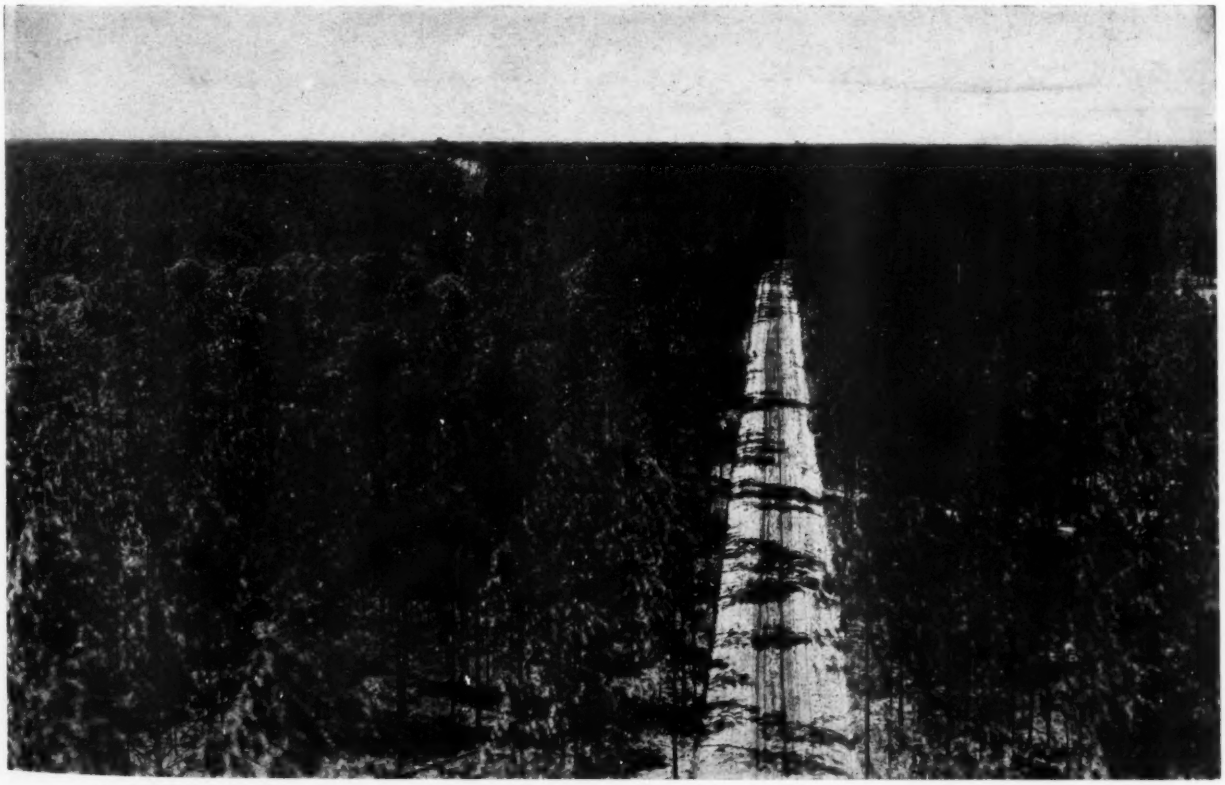
By JOSEPH C. KIRCHER

UNCLE Sam through the Forest Service of the U. S. Department of Agriculture is actively engaged in the rehabilitation of the Piney Woods of the South. Beginning in a small way many years ago, Service activities have expanded greatly, especially since 1934 when Region 8 was formed—with headquarters in Atlanta—to include eleven southern states: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee and Texas. Here in the great forest empire of the South, Uncle Sam is now well established for large scale forestry operations.

It would be misleading, however, to imply that the federal government in its forestry work largely neglected the South prior to 1934. As a matter of fact, it had been active in the region for more than thirty years before the regional office was established in Atlanta. As far back as 1912 after the Weeks Act had been passed by Congress, one of the first national forests to be established under the Act was in the Southern Appalachians. From that date, purchases of land for national forests went steadily forward until today the southern states mentioned above contain twenty-four national forests embracing over 9,000,000 acres of federally owned forests.

During the same period, federal cooperation with the states in fire control on private forest lands had been going forward, first under the Weeks Act and then, on a more extensive scale, under the Clarke-McNary Act of 1924. Through this cooperation the southern states had been building up well organized forestry departments. In the early 30's came the Civilian Conservation Corps, which reached its peak in 1934-35 with more than 50,000 boys working on forestry projects throughout the South. And by the middle 30's, the federal government had many years of forest research in the South to its credit.

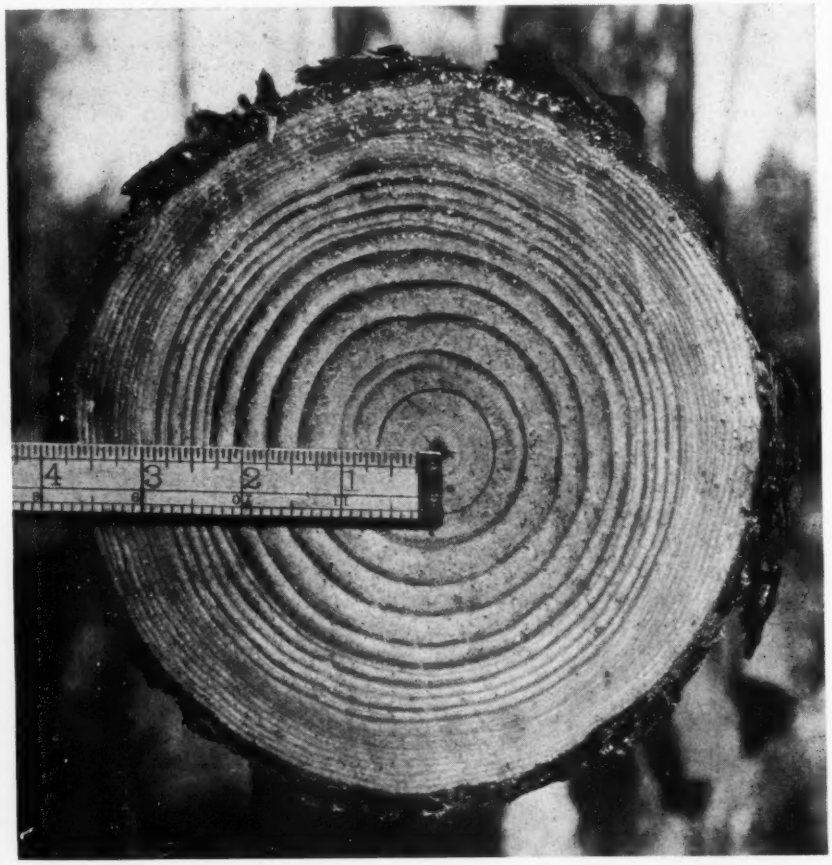
Under the leadership of the state foresters and the newly organized Region 8 of the Forest Service, forestry in the South therefore was well on the move in 1934. About that time came the realization by private owners of the importance of the South's Piney Woods and of their possibilities as a source of raw material if properly managed. The rapid growth of southern pine was



Uncle Sam's forest estate is expansive in the South—twenty-four national forests embracing more than 9,000,000 acres. Mostly cutover land when acquired, it is fast being restored to full productivity

brought home by the discovery that over extensive areas, young timber had sprung up naturally and was approaching merchantable size in spite of the tremendous abuse the forests were receiving through unwise cutting and uncontrolled fires. It is true that these timber stands were only about one-third stocked, but then there really was no reason to expect even one-third stocking.

With the nation slowly emerging from a depression and capital looking for new investments, what was more natural than that the forests of the South should attract attention? And in the late 30's they did. Many forest owners, naval stores operators and lumber companies began to acquire forest lands on which to practice forestry and to expand their operations. There was renewed interest in forest fire control and many additional areas were brought under good forest management. Most notable of the industrial development in the forest industry was the expansion of the pulp and paper industry in the South. As a result, more than $100,000,000 have been invested by these companies in the South and something over 5,000,000 acres of forest land, purchased by them, are under excellent protection and management.



Why selective thinning is good practice. Annual rings reveal retarded growth in this pine during last ten years because of crowded stand conditions

It has been shown that except on the poorer sites and devastated areas, the pine forests of the South can be successfully managed and will show good financial returns. Research has pointed the way to profits for many timber growers. There is evidence, too, that thousands of farmers have avoided financial disaster by harvesting timber to which they formerly attached no value and had given no care. Under such circumstances one would naturally suppose that forestry would be quite generally practiced throughout the South. But this is not the case.

In spite of the extension work of state and federal forestry agencies, of many successful forest management demonstrations throughout the Piney Woods, and of the financial and other cooperation of public agencies, southern forest management still lags. To a large extent, the forest industries recognize the financial possibilities of permanent management of southern forests. To some extent, too, the many small non-operating owners of timberland are recognizing these values. And yet there is a lack of public appreciation of the importance of this great forest resource in the industrial future of the South.

That conditions cannot be said to be satisfactory is evidenced by these few facts concerning the 180,000,000 acres of forests in private ownership in the eleven states of Region 8: (1) Organized fire control is provided for only forty-seven percent of the forest lands; (2) the forests are producing only one-third of what they are capable of producing; (3) not more than twenty-five percent of the privately owned forest land is under good management practices; (4) the drain on these forests was 5,500,000,000 feet above the growth in 1942, and 2,500,000,000 feet above the growth even in 1940 before the war; and (5) over 18,000,000 acres, once containing valuable forests, have been cut and burned to such an extent that they will have to be replanted, yet little or no effort is being made to do so.

Certainly not more than twenty-five percent of the forest land in private ownership is under constructive management and much of this is producing a great deal less wood than it is capable of growing. One hardly could call this a healthy condition, and yet it is infinitely better than it was ten years ago. It is useless, however, merely to complain about conditions. Instead, one must examine present programs and, if necessary, revise them to bring about the desired result.

In other words, what do we want to do with our southern forests and how are we going to do it? In broadest terms, perhaps we should say our objective is to make them of the most use to all. That means developing to the full their resources—timber, water, grazing, wildlife, recreation, minerals, and anything else which will be of value to our people.

We talk of the desirability of further industrializing the South. Here is a chance to expand a present industry which now furnishes some 500,000 man-years of employment annually, to more than twice its size, because these southern forests by proper management can be made to produce three times as much timber as they are now producing. This increase would take up the present overcut margin, and at the same time double employment. Is that not worth working for?

It cannot be done at once, because it takes time to grow timber, but that is all the more reason why we ought to hurry to make every acre of forest produce all it can. If we do not do that, we cannot expect to have a flourishing tim-

ber industry because no one can long run a business at one-third capacity and make it pay.

We can develop also our hunting and fishing in these forests as well as their other recreational possibilities. That will not only give local people a place to play, but it will bring tourists with money to spend. Isn't that worthwhile too?

But what is being done about this and what else is necessary? Really a lot is going on in cooperative efforts between forest owners, the states and federal agencies to bring about better fire control and better forest management. But a great deal more must be done. To get the best out of these forests all must work closely together. The timberland owners must cooperate closely with state and federal forest services and together must arouse public sentiment to a degree which will secure wholehearted public support for the protection and development of the forest resource.

The two greatest problems of our southern forests are to get much better cutting practices and to give the forests much better protection against fires. Both must be developed together if the forests are to contribute in largest measure to southern welfare and prosperity. Neither alone will produce the needed timber. It must be recognized, too, that southern forests are not merely local problems because much of this timber is required outside the South. That is why the federal government has a special interest in them.

No future in this — devastation wrought by clear cutting

Promise of prosperity—growing pines restore idle acres to economic production

Assistance by the federal government in getting better cutting practices, on anything more than a very small scale, is of recent origin. Some work had been going on for many years by both federal and state organizations, but only in the past few years has the Forest Service increased its cooperative activities for better cutting and marketing practices for farmers and other landowners. Especially has the work among farmers been greatly expanded in cooperation with the states, several of which now give almost complete service throughout their forested territories. Leadership and advice in more complex problems of forest land management are also provided by the Atlanta office of the Forest Service. In this connection, the South must soon give serious consideration to needed public controls

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STATE FORESTRY . . .

By H. A. SMITH

ANYONE searching for bottlenecks in state forestry work in the South should first study the magnitude of the problem involved—millions of acres of forest land in almost as many different types of ownership, large and small, and almost as many degrees of stocking and age classes that require protection and treatment in order to maintain and restore production.

Some forest areas are occupied by tenants who fully expect to move within the year; others by owners who are awaiting the first offer for sale; and still others are owned by people who live from fifty to a thousand miles away. Hundreds of thousands of acres cannot be expected to return a profit, even under ideal forest management, for decades to come; other thousands do not contain within their borders enough available men to make up one efficient fire-fighting crew. Many that are available have no interest in the land and hope only to be far removed from there before the results of their labor might bring increased prosperity to the community. Add to these conditions a hundred and fifty years of practices founded upon the elimination of forests, and you have a problem that could well frighten any less conscientious and aggressive group than those that today comprise the state foresters of the South.

In the face of this, however, tremendous progress has been made. State foresters have had leadership and guidance, particularly in the early days, and financial assistance from the federal Forest Service; some assistance has been given by the state extension services, either cooperatively or independently, and by other state, federal, and local organizations. On the other hand, what southern state foresters have accomplished has been done with pitifully small organizations, even smaller appropriations, and frequently in the face of open opposition from groups and individuals to whom wild lands were and occasionally still are free and open to whoever cares to cut, burn, graze, or use them in any manner whatsoever.

It is admitted that state forestry organizations have not been perfect. Sometimes governing bodies took a hand in administrative matters, forsaking the policy functions to which good business would have limited them. Politics have had a part, yet change of personnel has seldom meant change of policies. Turnover has been heavy, due primarily, however, to the success of the program itself through the creation of additional jobs for technical men. With the exception of one or two states, the turnover in southern state foresters has been no greater than that of departmental heads in the national organization.

Salaries have been low but in keeping with those of other officials of equal rank in the same state. Also, retirement features have been lacking. As a rule, however, this has not bothered the younger, aggressive type attracted to state forestry jobs. Southern states have been slow in adopting civil service.

All of these features might be termed bottlenecks—but not particularly serious ones.

The last decade has witnessed contributions to forestry from a dozen or more state and federal agencies either newly created or recently undertaking forestry work—the Soil Conservation Service, State Extension Services, Farm Security, the Land Banks, the AAA, and others. No one can question the value of the work they have done.

State foresters have viewed these new

PROGRESS OF STATE FORESTRY IN THE SOUTH IS ENTRUSTED TO T

Upper left, J. S. Holmes, North Carolina; upper right, F. H. Lang, Arkansas; center J. O. Hazard, Tennessee; lower left, W. E. White, Texas; lower center, M. H. Anderson, Louisiana; lower right, A. A. Legett, Mississippi

. . Its Role in The Pinelands

programs with interest. They have watched well financed programs initiated under their noses with personnel more numerous and better paid than their own. While struggling to secure increased production of planting stock in order to provide minimum cost to the public, they have seen federal nurseries established to provide free trees to their potential cash customers. They have seen relationships established that limited or threatened to limit their efforts to fire fighting and law enforcement.

They have seen a changed federal financial policy place them in an embarrassing position with the state legislatures. They have seen their position of authority on forestry matters within their state threatened by better financed organizations, and have had to answer the very pertinent question as to why the state should pay the bills when the federal government seemed willing to do the job. They have seen forests stripped to meet the payments of state and federal loaning agencies, and have witnessed silvicultural practices set up on demonstration plots contrary to recommendations of their own organization.

These things happened, yet from the standpoint of forestry, all of them have not been bad. Their effect on state forestry organizations has largely depended both upon the vision and the activity of the state forester and the attitude of those responsible for local administration of policies of the cooperating agency.

There is a real need for a coordination of these efforts—first, within the state to provide not so much a definition of functions of agencies as a combination of all agencies into one working program dedicated to the furtherance of all phases of forestry; and second, a channeling of all federal cooperative activities through that program with a view to the accomplishment of work to be done rather than as responses to requests from competing organizations.

Today southern state forestry organizations are not all geared to the interest they themselves largely have created. Along with years of low appropriations possibly justified by the lack of interest on the part of the public, they have been besieged on all sides by encroaching activities, have been fearful of attracting too much attention in an era when there were so many to do the work. A considerable portion of their problem has been lands upon which private capital could not be expected to raise trees; and they have experienced the use of police power threatened in their states because of its need elsewhere. Considering all of this, it is not surprising that southern state foresters so frequently hesitate to express the real situation because of the cost involved, that they become so embittered with the encroaching agencies that they lose sight of the really good things those agencies have done, and of their own responsibilities in securing the coordination of efforts within their states.

Maybe within these things will be found your bottlenecks. I am not sure. But of this much I am certain: State forestry organizations were created for the purpose of securing increased and continuous production of forest crops. The fact that any one of several southern states now spends more money for organized protection and for forest management than all the southern states together spent a decade and a half ago, is indication that tremendous progress has been and is being made. I am further confident that within these state forestry organizations, which have the confidence of the people, which are statewide in character, and which of necessity must be maintained throughout the year, there is the nucleus of a real forestry program once proper coordination and complete cooperation can be achieved.

GGRESSIVE LEADERSHIP OF THESE MEN — THE SOUTHERN STATE FORESTERS

Upper left, J. M. Stauffer of Alabama; upper right, Fred C. Pedersen of Virginia; center, Henry J. Malsberger of Florida; lower left, John M. Tinker of Georgia; and lower right, Charles H. Flory of South Carolina

PINE GROWERS

Many Forest-Owning Companies in the Southern Piney Woods are Launched Upon Programs to Make Their Lands—and the Lands of Others—Yield Continuing Crops of Timber. Here are Examples Typical of What These Pine Growers are Doing—Told by the Men Who are Directing the Programs.—*Editor*

TEN YEARS ago the W. T. Smith Lumber Company faced the unpleasant prospect of early liquidation. After almost fifty years of operating on timber tributary to Chapman, Alabama, the life of our mills appeared to be numbered by lack of growing timber to sustain them. We could see ahead only six or eight more operating years, at the end of which our remaining asset would be many acres of cutover land. At that time cutover land was a nebulous asset at best.

The situation naturally concerned us. We engaged in much thought and discussion of ways and means of prolonging the life of our business. Among them was the possibility of a sustained yield program of timber growing or as lumbermen now call it "tree farming" for the production of current crops of trees. Lacking information as to our growing stock of trees and what the forest lands available to us might be made to produce, such a program seemed a somewhat hazy and uncertain venture.

In 1933 an unexpected incident occurred. Quite by chance, Leslie K. Pomeroy, who was then developing a

A new crop of longleaf pine near Brunswick, Georgia, that will yield lumber, turpentine, poles and a variety of other forest products

By JULIAN F. McGOWIN

Manager

W. T. Smith Lumber Company

sustained yield operation at Wilmar, Arkansas, visited Chapman. With him we explored the subject of sustained yield as applied to our own situation. Pomeroy's visit proved to be the spark that fired us to action. Before another two years had passed, we had done three basic things to put us on the way to what we hoped would perpetuate our operations.

First, we formulated and put into effect in cooperation with federal and state agencies a plan of protecting our forest growing lands from fire. Second, we started selective cutting in the woods with the object of improving the quality and increasing the growth of the trees left for succeeding crops. Third, we completed a systematic field inventory of our forest resources, present and potential, and adopted a plan for the sustained yield management of forest lands tributary to our plant. Both the selective cutting and the inventory were carried out under Mr. Pomeroy's direction.

After almost ten years of continued operation, the company's forest program as originally set up remains today virtually unchanged. There have been refinements and developments, of course, and we have gradually increased our forest land holdings to 178,000 acres. Our first marking of trees to be cut was directed to trees seventeen inches and over in diameter breast high, but later we abandoned diameter as a guide and have since marked with the purpose of removing as many defective and crowding trees as practicable and of leaving good stands of healthy, fast growing trees well distributed over the land. Contrary to expectations the inclusion of an increased number of defective and crowded trees in our cut has not appreciably reduced the grade of our logs or lumber. And by favoring a residual stand of the more valuable species, such as longleaf pine, white oak, poplar and gum of sound growth, we are building a forest of higher quality logs and lumber for the future.

The transition to selective cutting involved a somewhat radical change in logging methods. To conserve young growth and to reduce damage to trees left for a later cut, we changed from railroad and steam skidder logging to tractors and trucks. Today all our logging is done by the latter, and we have found them a substantially cheaper method. Our policy is to build tractor roads sufficiently permanent for use in logging succeeding cuts every five to ten years.

In maintaining the output of our mills, it is necessary for us to draw upon timber owned by farmers in our territory. We have made it a special feature of our program to encourage and help all neighboring landowners to manage their woodlands on a tree crop basis the same as we do ourselves. We mark their timber free of charge and buy their logs at going market prices. We have now cut over more than 10,000 acres in other ownerships on this selective basis.

Since adoption of our forestry program the average annual cut for our own lands approximates 100 board feet Doyle scale an acre a year, of which seventy-five percent has been pine and twenty-five percent hardwoods. Growth studies indicate that our trees of sawlog size left for a future crop are growing substantially faster than this average. We therefore consider we are cutting annually less than our growth and that we now can look forward to permanent operations based upon a continuous growth of timber back of our mills. Wartime demands for wood have not greatly affected our program. We have made every effort to increase production from our own lands but shortages of labor and equipment have made only a small increase possible.

After almost ten years experience two needs stand out. One is the assurance of better protection of young timber from fire. We still lose too high a percentage each year due to fires carelessly set by local inhabitants. The second is the absence of markets for low grade hardwoods. We give cull hardwood trees to neighboring farmers for firewood and farm uses, but there is still too heavy a stand of cull trees in our territory. Until better fire protection is assured and markets for low grade material are developed standards of management comparable to those in some of the European countries prior to the war cannot be expected.

Scenes on the company's Tree Farm. Above — This area, selectively cut in 1942, yielded 6,000 feet an acre and left a fine, growing crop. Center — Tractors have replaced skidder logging to protect young growth. Bottom — trucks and tractors, instead of logging railroads, do the hauling

A shortleaf stand, two years after being selectively cut

By ERNEST KURTH

President Angelina County Lumber Company

ON MAY 5, the Angelina County Lumber Company at Keltys, Texas, will celebrate its fifty-seventh consecutive year of lumber production. Ostensibly there will be little difference between this birthday and previous ones, but underlying there will be more intense effort and deeper planning. We hope to have planned well enough that neither the usual nor the unusual will greatly deter us from our present objective—the production of lumber to help win the war.

The largest single change in company policy since the war started has been that of swinging a little more toward lumber production and away from tree production. This, of course, will hold true only for the duration. In the normal sphere of things we keenly feel the obligation of contributing to the national welfare by keeping our lands productive. We also have a personal feeling of attachment and obligation to our loyal customers and to our employees, many of whom have been with us for from twenty to forty years. I sincerely hope that by good forest management on our part, their loyalty through both the good and the bad years can be met with the guarantee of a chance to earn a decent and honest living in the future.

Equally as deep is our feeling about land heritage. The Angelina Company is now cutting over land which my father and his associates cut over in their lifetimes. From stands of pine trees which, as a boy, I can recall having thought would never make boards, good lumber is today coming to our mill—the product of growth and improved quality brought about by protection and management. One cannot live through such experiences without becoming attached to the soil. Nor can one become attached to the soil without developing a firm belief in free enterprise; for soil without its complement free enterprise, the right to own, develop, use and protect, becomes merely a part of this large earth. This is why I firmly believe that forestry practices as now developing on the lands of many large timber companies, even though often attended by the disadvantage of forced conversion and the current handicaps will, if allowed, eventually lead to sound policies of forest management.

We here in the South have been identified with the forest industries for fifty years. We have been fortunate in being able to study nature in action. We have seen land almost completely denuded by the saw and ravaged by fire come back to good quality timber. We have seen logs, piling and pulpwood cut from land which we can recall as having seen formerly growing cotton and corn. We have, on the other hand, observed trees growing so densely that they were no larger than four to six inches in diameter and yet thirty to fifty years old.

From such general observations and from many minute but significant ones, our forestry practice at Keltys is being evolved. It is as yet empirical and will probably remain so for at least the first several cutting cycles. We are, however, gradually beginning to know our lands intimately; finding that on this site we may expect good reproduction following a certain type of cutting and that on another site we cannot expect to grow trees larger than twenty inches because the soil is not adapted to windfirmness. Gradually we hope to piece the whole plan together, feeling that the end result will be a plan of land management embracing several more or less distinct types of forestry, so combined and interwoven as to be as complex and yet as simple as the pattern of nature herself.

This company has 125,000 acres of fee land ranging in character from longleaf cut-over, through second growth loblolly, to old growth shortleaf pine. Its plan of forest management is based upon these main policies:

(1) Retention of cutover lands and protection of its lands from fire. During the past ten years, the company's fire loss has been held to less than one percent.

(2) The adoption of selective cutting and conservative methods of logging of our own woods. Foresters mark all trees to be cut, removing about one-third of the volume and leaving young trees and as many larger trees as practicable for growth and another cut every ten or fifteen years.

(3) The application of selective cutting on lands of others from whom we buy timber. We cut timber, regardless of how we buy it, in a manner to best preserve the remaining young growth; and we encourage and help farmers and others to practice sound forestry.

(4) The development of closer utilization of waste material, cull and low quality trees that should be removed for the improvement of the forest. For example, our woods operations are integrated with those of the Southland Paper Mills at Herty, whereby small material suitable for pulpwood is sold to that company. Another effort is to develop a small portable mill to utilize low grade pines and hardwoods that otherwise would have to be left in the woods because they cannot be economically handled in our large mill. The removal of such trees can be made as improvement cuttings that will further serve to hasten growth and raise the quality of trees left.

It is our overall aim to keep our lands well stocked with thrifty trees of varying age classes, thus providing recurrent cuttings at fairly short intervals. Each soil and specie type has its particular characteristics. Although in some instances the location and site are not of our own choosing, we accept the responsibility of developing all of these lands to the fullest of their forest productivity. Fortunately, nature provides compensations—the poor sites grow timber of better quality and the better sites grow timber in the greatest quantity.

By EARL PORTER

General Superintendent, Woodlands Department,

International Paper Company. Southern Kraft Division

THE Woodlands Department of the Southern Kraft Division of the International Paper Company has the problem of supplying pulpwood to eight large pulp and paper mills in the South. The mills are located in Arkansas, Louisiana, Mississippi, Alabama, Florida and South Carolina, and can draw part of their wood supply as well from Texas, Oklahoma, Georgia and North Carolina.

The first and most dependable source of pulpwood needed to supply these mills is the 1,350,000 acres of pine timberland owned by the company. The greater volume, however, is obtained from non-company lands—from farmers and other small timberland owners. Thus while intensive management plans designed to grow the greatest volume of wood possible are applied to company holdings, it is also desirable that cutting operations on outside lands be conservatively planned and carried out.

The company-owned forests are divided into units of approximately 100,000 acres, each under one man responsible for administration of fire control, trespass, planting, timber marking, scaling and incidental details. Technically trained foresters are employed for this work. The centralized administration handles policy, taxes, right-of-ways, timber sales and titles.

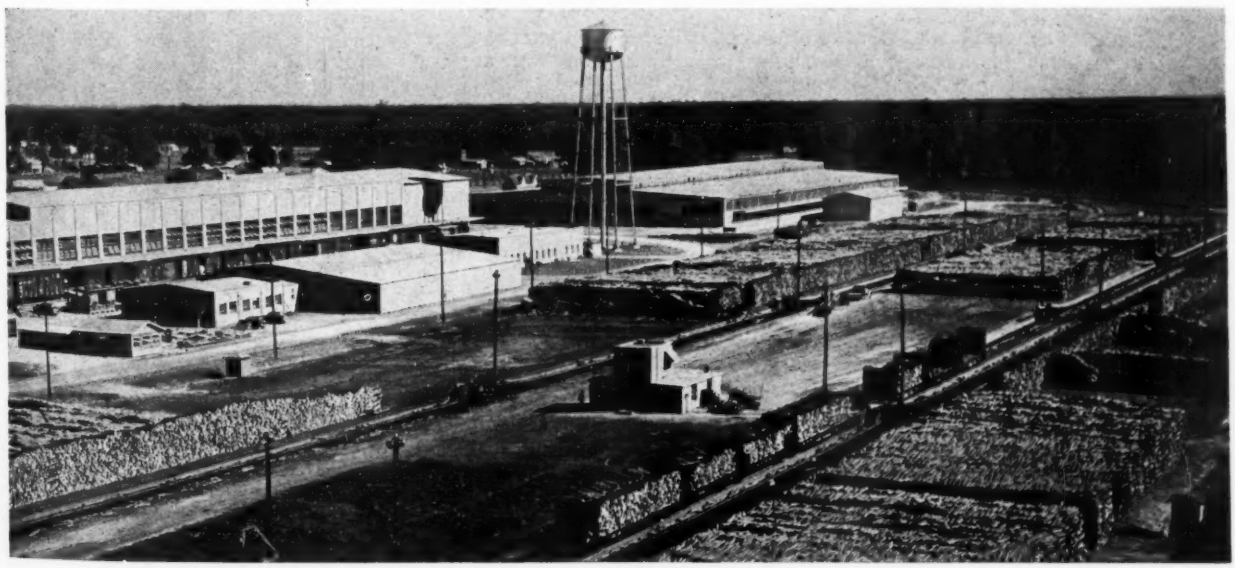
The harvesting of pulpwood, sawtimber, poles, pilings and other products on company lands is planned so as to build up growing stock and maintain maximum production. All cutting follows a careful selection of trees to be removed. Thinnings are made where necessary to maintain growth and avoid stagnant stands. Planting operations are carried out on good sites with suitable protection from fire. Where such service exists, company timberlands are included in state forest fire control programs. Additional fire-fighting equipment and manpower are supplemented by the company when needed to provide adequate protection.

In its conservation work on outside lands, the company has gathered from areas surrounding the mills data showing the volume of timber available, class of forest ownership, timber growth and drain from all sources. With this information, plans are made to properly distribute the source of pulpwood, thus perpetuating the supply near the mills.

To encourage better forestry practices on non-company lands, educational activities have been carried out in cooperation with the Southern Pulpwood Conservation Association, the state forest agencies, the state extension services, the federal Forest Service and other organizations working the field of fire control and timber growing and harvesting. The company's technical personnel is assigned to this program, which consists of activities demonstrating good cutting practices, better utilization of logging and mill waste, proper thinning methods, and how best to utilize storm and fire damaged timber. Assistance is made available to farmers and small landowners in the marking of their timber and, in many instances, local timber markers have been trained. As a rule, farmers are encouraged to cut their own trees; this generally results in a better woods job, and more money in the farmer's pocket.

Thousands of small pine plantations have been established in the southern Piney Woods as the result of the company's policy of distributing seedlings to farmers, small landowners, Boy Scouts and 4-H Club members. These young trees are planted on vacant lands and, in the aggregate, will add materially to the productive forest area in some regions.

At present, the company's program is subject to many adverse circumstances in world conditions, regulations, markets and timber stocking. Nevertheless, it is going right ahead in its efforts to educate the public to its responsibility with fire and to convince small timberland owners that they hold the responsibility of good forest practice on their own lands. As to the program on company-owned lands, several more years must pass before ideal stands and growth may be achieved, but a creditable start has been made. The Southern Kraft Division of the International Paper Company is definitely in the business of growing pines.



Object of company's forestry program is to perpetuate pulpwood sources surrounding its eight mills, one of which is shown here. Company-owned forests are intensively managed—cuttings on non-company lands closely regulated

By E. A. HALL

Forester,

Container Corporation of America

THE forest conservation program of the Fernandina, Florida, plant of the Container Corporation of America, which draws its wood supply from forest landowners in north Florida and south Georgia, has been established as a cooperative agreement between the timberland owner, the producer who cuts the timber, and the company.

Initiated at the time the timber is purchased and cutting arrangements are made, the plan, by mutual consent, provides for one of three cutting methods. First, and most preferable, is a selective or improvement cutting wherein worked-out turpentine trees, along with slow-growing, deformed and poor quality trees are removed to permit vigorous, sound trees of good quality to increase in volume. Second, is seed tree cutting —advisable if a timber stand is totally worked out or is so retarded that trees will not respond to selective thinning. In this case, from four to six of the most desirable trees are left on each acre to reseed the area. All of the others are harvested.

The third and least desirable method is clear-cutting. The lands so stripped generally will not come back into production for a quarter of a century—and then, perhaps, only under the stimulus of artificial planting. Since it was to combat this practice that the Container Corporation plan was initiated, no timber tract is knowingly accepted by the company for clear-cutting unless the owner furnishes proof that the land is to be utilized for agricultural purposes or improved pasture, and provided also that the land is suited to the purpose for which it is designated.

Whatever the method decided upon, the company forester makes periodic visits to the operation after cutting gets under way to give technical assistance and to report on the manner and progress of the work. He maintains a record of such specific data as the method of cutting, species being cut, marking methods, specifications, timber units left an acre, the amount of seedlings and reproduction, the height of stumps and the approximate date of the next cutting. Copies of his reports, which also contain the names of both landowner and operator, the number of acres being cut, purpose of cutting, the use made of the land, and the attitude of the owner toward fire protection, are sent to the state forester and to the Southern Pulpwood Conservation Association.

Although actual application of this system has not proved a hundred percent effective, some cuttings being unsatisfactory, results on the whole have been gratifying. To landowners who have responded to selective cutting methods, it has proved a simple and practical forest management plan. To others, particularly to those who desired to clear-cut their timber, it has been an instrument of education, a promoter of the sound business of good forestry practice. This effect is strengthened immeasurably by the company's refusal to accept wood from tracts where the owner insists upon clear-cutting without substantial reasons.

A well-managed fo. .st has two distinct characteristics: a continuous yield assured by selective cutting, and a new crop of seedlings assured by protection from fire. Despite all that may be done in favor of natural reseeding, however, there are certain areas which, for one reason or another, fail to come back readily. In such cases, artificial planting is both desirable and practical. This the Container Corporation is encouraging by free distribution of pine seedlings.

Now in its third year, this reforestation activity is aimed at the reclamation of clear-cut areas, abandoned fields and other barren lands. A million seedlings a year have been distributed to landowners throughout the area from which the company receives its wood supply. These, in the hands of hundreds of small landowners who otherwise may never have reclaimed their idle acres, are reestablishing thousands of acres as timber-growing and tax-paying land.

Using the average number of trees ordinarily planted an acre, one year's planting of 1,000,000 seedlings will restock about 2,500 acres. If three-fourths of the seedlings survive, twenty to twenty-five years hence enough lumber can be harvested from the 2,500 acres to build more than 10,000 five-room houses. Or, if the timber is cut for pulpwood, it would keep the company's Fernandina plant in operation for almost a year. The reaction of the landowner can best be illustrated by a remark made by an Alachua County farmer: "I've planted 1,000 seedlings each year for three years. By the time my three boys are grown, those trees will be big enough to cut. I figure I can get enough lumber and pulpwood from them to build and furnish each a good house."

Common sense utilization and fire protection are all that are needed to obtain a continuous yield and natural regeneration on most forest land in the Southeast. Therefore, Container Corporation of America believes that the combination of its conservation plan, operating as it does with hundreds of small landowners, and its program of reforesting barren lands by the distribution and planting of seedlings, will greatly aid in the establishment of a permanent reservoir for the nation's wood supply.

Hundreds of small landowners are planting a million pines a year on barren fields, the result of the company's program of reforestation

CAN THE SOUTH CONQUER THE FIRE SCOURGE?

by [illegible]

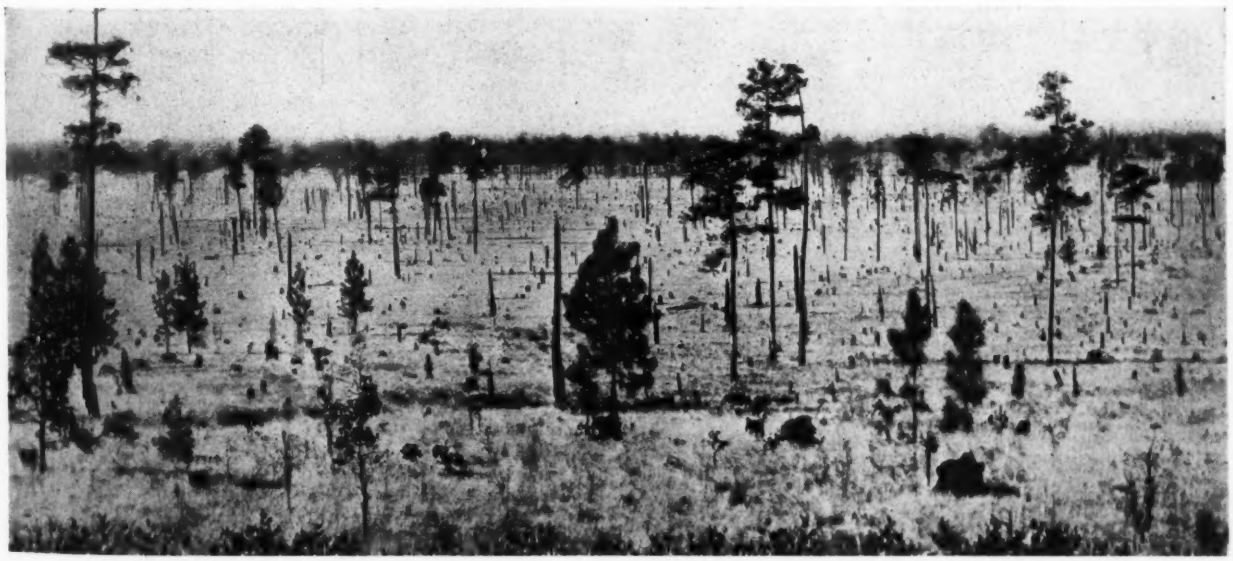
AS THIS is written, news comes of the death of Senator Charles L. McNary of Oregon, co-author of the Clarke-McNary Act of June 7, 1924, which established a broad authorization for federal aid in forest fire control. It seems appropriate, therefore, to review the progress of these twenty years and to attempt an analysis of the question posed by the title of this article.

Prior to 1924, little effort, either public or private, had been made to stop the wholesale destruction of timber by fire which had been going on in the South for many years. At that time, Virginia, North Carolina, Tennessee, Louisiana and Texas had small, weakly supported state forest services; the other states had not made even this small start. County officials were not interested and forest landowners, with the exception of a few brave pioneers, did not care or believed that control was impossible.

The federal government for a dozen years had made a small contribution under authorization of the Weeks Law for the protection of the headwaters of navigable streams. In the South, the expenditure was confined largely to the Appalachian Mountain region. Southern national forests, restricted at that time to the southern Appalachians, west Florida, and Arkansas were inadequately protected. With the exception of scattered tracts unintentionally protected by isolation, it is doubted that as much as 1,000,000 acres were free from periodic uncontrolled fires.

Such was the general picture in 1924. Only the strong reproductive capacity of most southern species, their acquired resistance to fire, and the fact that some of the uncontrolled burns have been beneficial rather than harmful, can explain the fact that the South still has a fair stand of timber.

Progress in the past twenty years—that is, since the real beginning of forest fire control in the South—is inadequately represented by the bare statistics of acres protected, acres burned, and even less by the amount of money spent on fire control efforts. The statistics do tell us, however, some of the things we need to know.



Chief obstacle to timber growing in the South is uncontrolled fires. To overcome this, the author contends, we must deal more realistically with the reasons for woods burning—with the people who set out fires

From the tables below it will be noted that considerable variation exists in the source of funds. In some states private money is a significant part of the total; in others it is of small importance. Originally, the thought prevailed that private forest owners should pay half the cost and it was hoped that a practicable method of collecting these funds would be developed. Experience in this has been disappointing, and meanwhile has come a widespread feeling that the public interest justifies a larger investment than originally contemplated. Actually, a policy of expediency has been followed. Fire control organizations get the money wherever they can. The most significant development, and one of the most encouraging has been the rapid increase of county expenditures on fire control during the past ten years. Many poor counties are contributing half the cost of county-wide protection, using money that is needed for schools and other services. The extent of county participation is a measure of local public interest, just as the size of the state appropriation indicates the degree of state-wide interest.

No one will insist that all the "protected" area is adequately protected. The policy generally has been to spread the available funds thinly on the theory that it is better to provide some degree of protection to several acres than to give complete protection to one. Admittedly this results in serious losses during abnormally bad fire seasons, but young stands of timber have become established on millions of acres under this policy. In other places the investment of previous years' efforts has been wiped out on a windy afternoon. Whether or not a profitable crop of timber can be grown with an annual uncontrolled burn of two percent of the area, or three or even five percent, depends on the severity of the burn and where it occurs.

The twenty-year record is not bad. Neither is it so good that one is tempted to be complacent. In most cases the fire control work has been done as competently as could be expected with the available knowledge, experience and money. One could find much to praise, but it is more profitable to explore the possibilities of improving the record. Progress has been too slow. Protection needs to be extended at a greatly accelerated rate. It is unthinkable that twenty years hence we still shall be permitting millions of acres of young timber to be destroyed by uncontrolled fires.

We must guard against a tendency to oversimplify the problems and, consequently, their solution. For example, we need more money, public and private, to carry on with the job. We also need more and better equipment. But if we center our thought too exclusively on these physical and tangible needs to the exclusion of the more elusive, less clearly defined factors we shall certainly fail to accomplish what is urgently required. Too much of our effort has been spent trying to extinguish fires faster than rural people can start them. Bigger and better engines of suppression in great quantity with all the attendant gadgets will not by themselves enable us to keep ahead of the woods burner. He is learning to wait for a dry afternoon with a high wind in the right quarter. Much as we need more and better equipment, along with better trained suppression forces, the lack of these things, it would seem, is not the most important cause of our failure to make the desired progress in fire control.

It is quite possible that we have failed to understand fully the reasons for woods burning and to deal effectively with the underlying factors. Some of these factors are, to be sure, beyond our immediate control as, for example, the economic status of the landless resident who lacks interest and incentive because his stake in the future of his community is not apparent. Unstable ownership is in somewhat the same category. The two are related in many cases—examples of underlying evils which complicate what would otherwise be a relatively simple technical and executive problem. We can do something about both.

Most fires are started by people who have reasons for burning the woods. Accidental and lightning fires do not bulk large in the total list each year. We need to get at the reasons for the intentional fires and to deal with the causes as the intelligent physician treats the causes of human ailments. There is not room enough in the jails for all the people who stick fire into other people's woods, so fire law enforcement is not the final solution.

There is not space here to discuss this subject thoroughly even if the writer knew all the answers, and he does not. Some of the lines of approach, none of which are new, can be suggested, however. All have been tried by others with success here and there. In most cases the fundamental principle involved is adjustment and compromise.

Take the case of the cattleman. In most parts of the South he has for generations been accustomed to grazing his stock on the unfenced woods range no matter who happens to own it. He does not pay for the privilege. He wants part of the range burned off in the late winter for early green grass or for other reasons. It is academic and futile to argue the legal or moral aspects of the question. Probably he has no right on the property, but that doesn't keep him

TABLE 1. STATE AND PRIVATE FOREST LAND FIRE CONTROL RECORD—1942

State	Area Needing Protection	Protected			Unprotected	
		Area (Acres)	Burned (Acres)	Percent Burned	Area Burned[1]	Percent Burned
Ala.	18,177,000	12,845,000	347,650	2.70	1,522,967	23.56
Ark.	19,936,000	10,447,000	197,288	1.88	1,493,800	15.74
Fla.	20,684,000	6,237,000	165,524	2.65	8,361,453	57.87
Ga.	20,562,000	6,350,000	134,502	2.11	4,008,429	28.20
La.	15,720,000	5,731,000	182,453	3.18	900,000	9.00
Miss.	14,834,000	6,283,000	211,264	3.36	3,678,900	43.02
N. C.	16,930,000	12,182,000	567,242	4.65	264,288	5.56
Okla.	12,732,000	1,432,000	96,659	6.74	3,937,500	34.84
S. C.	12,187,000	7,910,000	186,159	2.35	1,100,000	25.71
Tenn.	12,893,000	5,566,000	146,018	2.62	476,110	6.49
Texas	15,800,000	8,868,000	145,806	1.64	433,000	6.24
Total	180,455,000	83,851,000	2,380,565	2.83	26,176,447	27.09

[1]The figures in this column are rough estimates and are not as reliable as the protected area figures.

TABLE 2. MONEY SPENT ON STATE AND PRIVATE FOREST FIRE CONTROL[1]—1942

State	Federal Government	State & County Governments	Private Owners	Total
Ala.	$ 73,698.85	$ 108,207.03	$ 84,350.00	$ 266,255.88
Ark.	63,783.82	75,588.73	95,281.91	234,654.46
Fla.	112,504.63	168,879.62	120,650.66	402,034.91
Ga.	84,328.89	59,691.71	51,087.40	195,108.00
La.	87,400.65	147,091.09	42,000.00	276,491.74
Miss.	47,143.42	98,849.03	.....	145,992.45
N. C.	69,105.80	96,674.33	19,202.84	184,982.97
Okla.	23,465.58	7,966.15	19,000.00	50,431.73
S. C.	50,995.58	160,749.15	4,581.37	216,326.10
Tenn.	30,168.40	60,885.33	.....	91,053.73
Texas	46,267.98	83,801.40	14,021.74	144,091.12
Total	$688,863.60	$1,068,383.57	$450,175.92	$2,207,423.09

[1]Exclusive of Federal emergency funds spent on critical war areas.

off. The expedient course in many cases is to work out an adjustment, letting him have a "burn" where it will do the least harm, and in the manner that will cause the least damage. This particular compromise is quite common in practice today.

Then there is the case of the woods resident who burns around his premises as a safety measure because he fears a disastrous fire that will destroy his home or property. His reason is based on experience—and usually he is right. An adjustment to meet his needs is not difficult to make.

The turpentine operator, too, has had valid reasons for burning his area. It has been, in most cases, the only way he could protect himself against accidental fires which destroy his investment in cups, tins and "faces." Adjustments in fire control plans to permit controlled burning of turpentine areas are customary. A majority of the turpentine fires, strictly speaking, do not deserve to be called "controlled burning." Too often they are uncontrolled broadcast burns and, consequently, are very destructive to young timber.

It would be simple to cite other examples of necessary adjustments and compromises. We cannot deal successfully with a problem affecting the interests and the customs of millions of people unless we are willing to practice the fine art of compromise.

Timber growing land — kept unproductive by annual fires

Young stands of timber are becoming established on millions of acres because protection is provided. A fire-break guards these nine-year-old pines

We have been too reluctant to listen to the native who used fire to serve his purposes and to learn from his experience. He has always used fire as a means to an end and, in his viewpoint, fire was not the evil we proclaimed it to be. He used it unwisely in most cases, to be sure, but there was more validity to his practices than appeared on the surface.

About fifteen years ago a few forest owners in the South, and more particularly in south Georgia, began the controlled use of fire as a means of protecting young timber stands against complete destruction. They were convinced that complete exclusion of fire from their forests was impossible so they chose the time, place, and manner of burning instead of leaving it to chance or the whims of their neighbors. Austin Cary, H. H. Chapman, and a few others encouraged this experimentation and added to it with their own experiments. Recently, the U. S. Forest Service has adopted the practice on carefully selected areas of the longleaf-slash pine type in the Coastal Plain national forests. The

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SOUTHERN PINE—

By CHARLES R. ROSS

THE southern Piney Woods is largely an aggregation of farm woodlands. In this warm land of multitudinous farms and few cities, people live close to the soil—and to the forest.

Probably three out of every four acres of the southern pine forest is held in private, non-industrial ownerships numbering somewhere in the neighborhood of a million. Possibly half of these ownerships are partly in crops or pastures, but most of the other half fit better into the farm woodland category. Many individuals who live in towns make a business of owning land, farming some portions or not, depending on availability of labor and other circumstances. Foresters employed to assist farmers are in practically all cases working also with doctors, merchants and mail carriers who own timber. If an individual happens to be growing only trees on his land, it seems the most practical approach to consider it a "tree farm"—taking a leaf from industry's tree farm program.

Annual owner returns from these millions of acres of woodland amount to about a dollar an acre, assuming a moderate value for the wood used on farms. Since the main products, such as sawlogs and pulpwood, are mostly sold as stumpage, the timber dollar is more like money saved, and means several times as much to growers as does the cotton dollar, most of which is paid out for labor, fertilizer, and other expenses. Processing and handling of farm-grown timber create employment and wealth all down the line, values in the general economy exceeding owner returns many times. Thus, when Extension Forester Montgomery A. Payne says Mississippi timberland owners received $20,000,000 last year, he points out that the same harvest enriched the overall state economy by $150,000,000.

While recognizing that farm woodlands fall short of being as productive as they might be, most foresters agree that long strides towards productive management have been made in the last few years. To fully appreciate this one needs only to look back at conditions twenty-five years ago, when the first forestry project was planned in the Piney Woods. Said the late W. R. Mattoon, esteemed federal extension forester for the region, ". . . the prevailing idea was that there was no such thing possible there . . . owners of woodland, large and small, thought only of how to get every cent out of their timber with little thought of future timber crops. . . . It is probably safe to say that not more than a half dozen farmers could be found in any one southern state who had an appreciation of the value of their timber as a permanent farm crop."

Even fifteen years ago the response of farm woodland owners was admittedly slow. What conditions prevented a growth of popular interest which would have speeded organized fire protection and by general demand brought in the forestry education and assistance which proved so fruitful later? There were reasons—good ones, as it seemed to landowners then. Among other factors, there were low prices and lack of markets for much second growth timber; contempt for the newer growth; continuing decline of lumber use in construction; uncertainty regarding "new-fangled ideas"; universal woods burning;

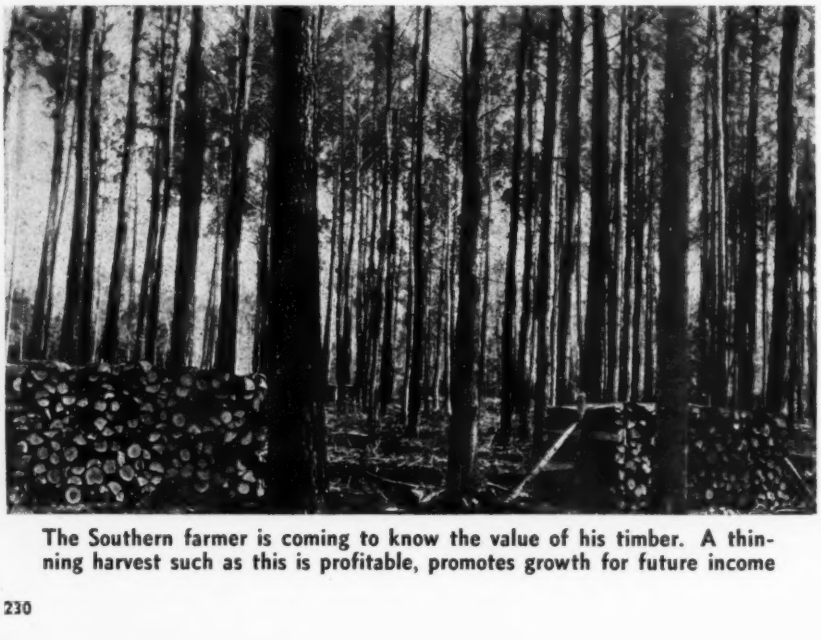
Technical service—foresters now assist farmers with management plans

and lack of research data for recommendations.

As an example of the last, Les Pomeroy, model timber grower in Arkansas, in 1927 asked seventeen forestry schools for management recommendations, and was offered seventeen different schemes. He decided he must work out his own.

The last seven or eight years have seen more encouraging conditions—better markets, a more hopeful fire situation, educational work multiplied many times over, and beginnings made in technical service. In fact, developments are coming so fast in some districts that one has difficulty keeping his information abreast of all that landowners, foresters and industry are doing.

Proper cutting methods will usually keep southern woods permanently and increasingly productive, with reasonable fire control, of course. Are farmers in-

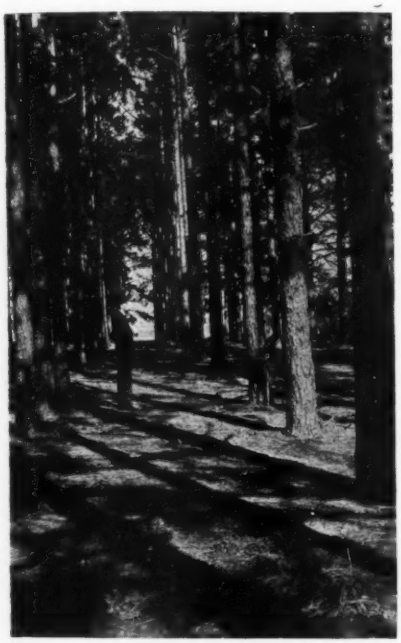


The Southern farmer is coming to know the value of his timber. A thinning harvest such as this is profitable, promotes growth for future income

—FARM CROP WITH A FUTURE

terested in right methods of cutting? Since scientific, partial cuttings are new and unfamiliar procedures to the great majority of owners and operators, technical assistance is usually necessary to start the ball rolling.

The agencies that have foresters to render this assistance are generally being rushed to death. In South Carolina



Forty-year-old pines—one of the oldest farm plantings in the South

the Division of Forestry and the extension foresters reported early this year, "The landowners are way ahead of us now. Every mail brings in another flood." Said an Alabama farm forester, "We've soft-pedaled publicity on this work, because we're getting more requests than we can keep up with." Unable to locate more foresters, State Forester John M. Tinker of Georgia, is now training local men to assist landowners in selective cutting, on a fee basis.

Considering the usual conservative attitude of farmers everywhere regarding unfamiliar procedures, the response to selective cutting promotion shows that the majority of owners can be expected to take hold.

Beginnings were made with the technical assistance idea five or six years ago in several southern states. Chief credit goes to the U. S. Forest Service and the federal Soil Conservation Service for developing the method, both working largely through state forestry departments. However, some of the extension foresters produced excellent demonstrations, and a number of farsighted mills had their foresters assisting neighboring landowners. The promotion of selective cutting by several south Arkansas mills attracted the attention of all forestry leaders five years ago, and the work has expanded since. Said a northern forester visiting there recently, "Six large mills are offering selective cutting service and the private owner in the area is almost forced to practice forestry in spite of himself."

The writer does not have figures at hand, but he would estimate that perhaps a third of the counties of the Piney Woods region are now served by area foresters or have a comparable service. This estimate does not include the numerous Timber Production War Project foresters borrowed from the Forest Service and working with the WPB, but this duration set-up is helping to introduce improved cutting methods. J. A. Cope, veteran New York extension forester, recently completing a Pack Foundation study, says of the area forester plan: "In that direction lies the future of farm forestry." It is undoubtedly the outstanding recent development. Most everyone feels that the area forester system will be expanded after the war when foresters are again available.

Extension Forester R. W. Graeber states that North Carolina plans to push the idea in all counties, broadened to include all phases of farm woodland management. He reports that in six months of 1943 eight foresters covering twenty-seven counties assisted 437 owners in the harvest of 30,000,000 feet of sawtimber, 9,300 cords of pulpwood, and many other products with cash returns totaling $351,000. In South Carolina the Division of Forestry and the Extension Service have a cooperative arrangement and offer personal assistance anywhere in the state, but do not have all the workers that are needed. They charge around twenty cents a thousand feet for marking timber. Extension Forester W. J. Barker reports fifty publicly and privately employed foresters working on the private woodlands of this relatively small state.

Twelve area foresters of various agencies, not averaging a full year, directly assisted Alabama landowners in the marking of 40,000,000 board feet in 1943, thereby achieving in a single year more demonstrations of right cutting methods than in all previous years.

Farm forestry leaders think it is justifiable policy to give some personal service, provided the owner or his representative actively participate, and that the forester does not spend undue time on one property. The usual plan is for the owner or an employee to acquire sufficient training, or to hire a trained person.

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Following a system of selective cutting, and using farm labor, this owner produces up to 50,000 feet of lumber a year, much of it from quality logs

SMALL SAWMILLS

Together With Small Landowners, They Present Both a Problem and an Opportunity

By J. W. CRUIKSHANK

Small portable mills of this type cut more than sixty percent of all lumber produced in the South. Operators, owning relatively little forest land, obtain their timber from hundreds of thousands of small woodland owners

THE lumber industry in the South is nearing the end of an era. When Lake States lumbermen moved south in the 1890's, large band mills were established to harvest the magnificent stands of virgin yellow pine that stretched from Virginia to the plains of Texas. For nearly forty years, large mills, some capable of cutting over 50,000,000 feet of lumber a year, dominated the industry. Even as late as 1929 nearly two-thirds of the lumber was cut by 600 band mills with capacities of more than 5,000,000 feet a year.

Between 1930 and 1942 the picture changed. One-fourth of the large mills closed down entirely and the average production of the remainder declined nearly one-third. Small mills, mostly of the circular portable type, became very numerous and in 1942 cut more than sixty percent of all lumber produced. This development was brought about by the change in the character of the timber supply. Most of the high quality old-growth timber has now passed through the band mills, and in its place has grown a new crop of trees.

This crop is, for the most part, still young. On much of the area, the immature trees occur in scattered stands. This is particularly true of the Piedmont where the forest land is broken into small areas by agricultural development. The low volume stands will not efficiently support large band mills, but they do provide a source of supply for approximately 18,000 small mills.

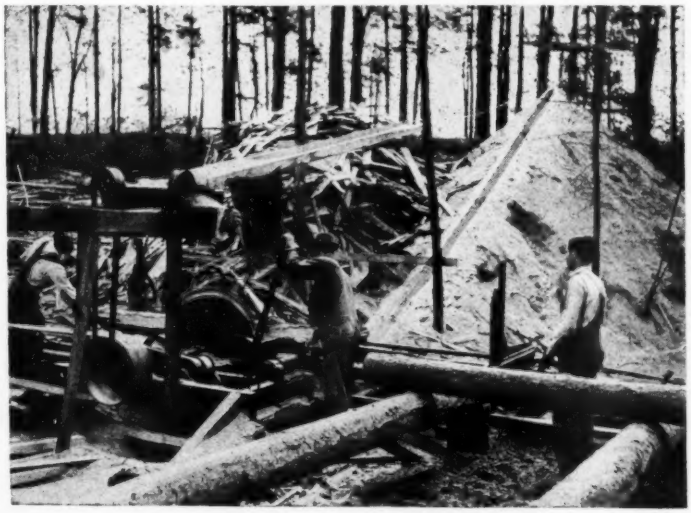
The South is such a vast area, with so many variations, that one general statement usually will not apply to all parts of it. So it is with small sawmills. Although they are present in almost every county, they are particularly abundant in the rolling Piedmont extending from the Potomac to the delta lands of Mississippi. In Oklahoma, Texas, and Louisiana large band mills still produce two-thirds of the lumber, and in Arkansas and Florida fully half of the production is from large-scale operations. In Georgia, however, ninety-five percent is cut by small mills and the proportion is nearly as great in Virginia, North Carolina, Tennessee, and Alabama. In the four leading southern lumber-producing states — Alabama, Georgia, Mississippi, and North Carolina—small mills cut four-fifths of the entire production.

What are the characteristics of this small sawmill industry that ranks so high in the lumber production picture of the South? Most striking is the great number of individual units in operation. Almost equally impressive

is their small size. Thousands of them cut less than 5,000 feet a day.

In general there are two types: the small custom or plantation mill that operates intermittently about twenty days a year, and the regular commercial mill operating fifty to 200 days a year, which produce the bulk of the lumber entering trade channels. The smaller of these are owned and operated by farmers, but the largest and best-equipped are operated by individuals whose year-around occupation is lumbering.

Equipment on most operations is simple and frequently not in good repair. Practically all of the mills use circular saws but probably not over half of them are equipped with edgers and relatively few have trimmers, planers, or dry kilns. The usual product of these small mills is rough, green boards or two by four-inch dimension stock. All too often, a small mill is not adjusted properly, and the lumber is very poorly manufactured. As a rule, the mills in the Coastal Plain and south Arkansas are larger and much better equipped than those of the Piedmont.



Too many roving mills are cutting too much timber too soon. The usual product is rough lumber poorly manufactured — of low value

Because of their portability, most of the mills are located within or adjacent to the timber that is being cut. Some change location as many as twenty times in a year. Frequently, new "sets" will be made for as little as 15,000 board feet. This means that practically any small stand of merchantable timber can be operated.

Financial troubles plague many, if not the majority, of the small operators. Because of the low initial investment, it is relatively easy to get into the sawmill business, but once in, it is very difficult for those without sufficient additional capital to stay in. As a result, it is common to find an individual mill changing hands several times during the course of a year—the preceding owners frequently in debt because of their venture.

This all adds up to an example of decentralization carried too far. Because of limited financial resources the small operator usually has no bargaining position. Also, having only a small quantity of low-quality lumber which must be converted quickly into cash, he normally is forced to sell on the buyers' market. Thus at the year's end he often has little to show for his investment and labor. Recognizing this he attempts to maintain a greater margin for profit by paying low wages, buying timber at less than its true worth and cutting too heavily. This contributes directly to two vital problems of the South—low per capita incomes and improper use and development of the forest resource.

Some progress has been made in raising the wage level through the establishment of federal controls over wages and hours. In the long run, however, the ability to pay satisfactory wages will depend upon an improved system of timber utilization and marketing that will leave more of the inherent values of the timber in the hands of the primary lumber manufacturer. Such a development should recognize the necessity of having an ample and permanent supply of timber, and must be correlated with the needs of the many thousands of landowners who are growing it.

Today, over ninety percent of the South's commercial timberland is in private ownership. Of this, only a small part is owned by forest industrial companies practicing sustained yield forestry. Another small part is composed of large tracts owned by banks, railroads, insurance companies and wood-using industries not organized for permanent operation. It is estimated that eighty percent of the commercial forest land in the South is in ownerships

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Opportunity lies in expanding the number of medium-sized mills manufacturing better grades of lumber. Increased profits would enable the operator to pay more for his logs, encouraging small landowners to grow trees as a crop

THE PINEY WOODS' CHALLENGE TO RESEARCH . . . . .

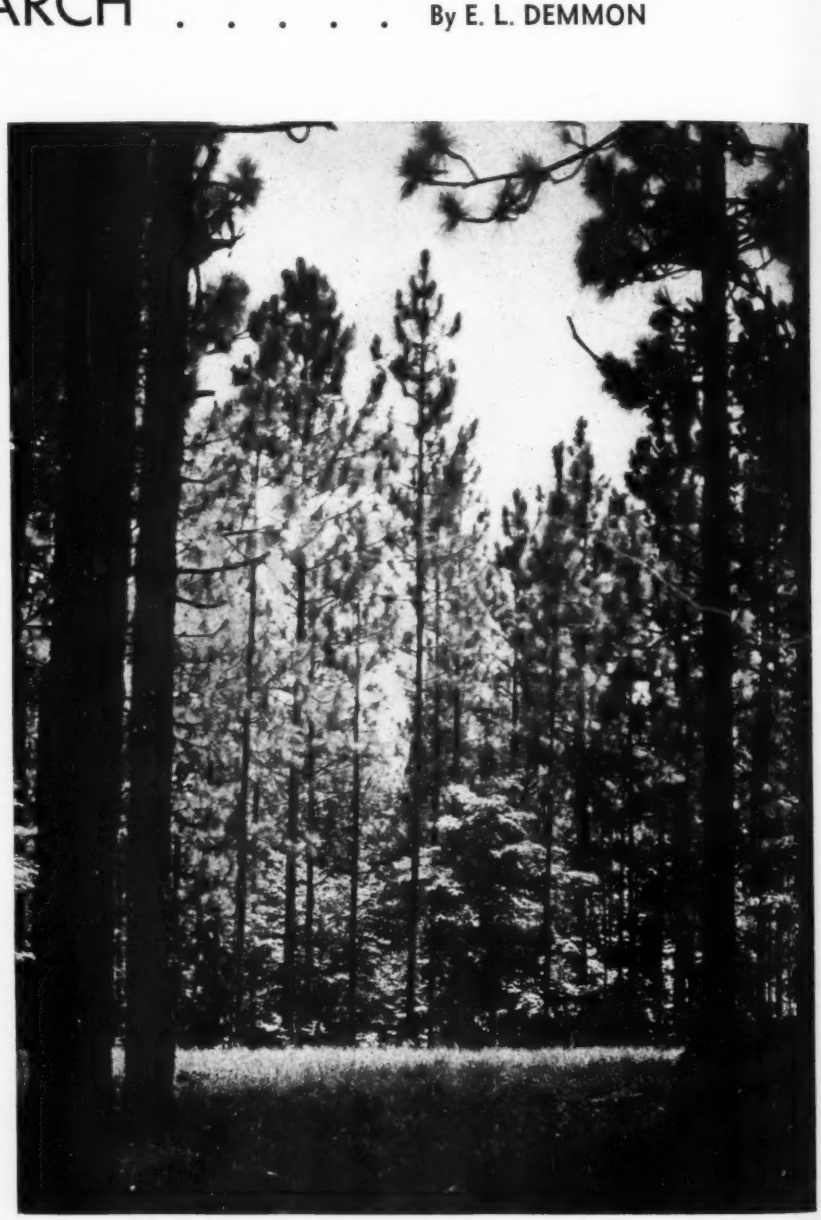
By E. L. DEMMON

THERE will always be a Piney Woods!

After more than a century of timber exploitation, and almost continuous efforts to clear off trees for farms and pastures, more than half the land area of the South still bears some kind of forest growth. True, these forests are a far picture from the magnificent stands which confronted the early settlers. No longer can we find the huge construction timbers, clear heart pine stringers, and 100-foot piling which have been easily available in the past. The 1944 forests are characterized by second,- third,- and even fourth-growth trees, which have sprung up since the original virgin stands disappeared under the ax. For the most part, present-day forests are but partially stocked and have grown up voluntarily, in spite of frequent fires and lack of attention.

Let us be optimistic and assume that the Piney Woods of the future will be better cared for than were our forests of the past. Eventually we will attain for them adequate protection from wildfires as well as from epidemic outbreaks of insects and diseases; harvesting of timber gradually will become more conservative and better planned; natural restocking will be had by following a few simple rules of silviculture; and growth rates will increase. Where the average Piney Woods acre now supports but 900 board feet of sawtimber, in the future it may carry an average of four or five times that volume. Instead of a present growth rate of 100 board feet an acre each year, it will be 250 or even 300 board feet, on the average, and of better grade. This picture is not fantasy—in fact, many southern forest stands are today exceeding these growth rates.

There is every reason to anticipate that this increased forest growth will bring increased markets, expanded industries, more work for labor, and additional returns to forest communities. all of which adds up to a better standard of living for the people of the South. The rapidity with which this prediction is attained will depend largely on how soon the man on the street and at the crossroads becomes conscious of what the Piney Woods means to him individually and what fire protection, skillful management, and conservative cutting can contribute to a better living for all.



There will always be a Piney Woods, says the author. Good forest management to maintain well-stocked stands will assure its economic future

How will the future Piney Woods differ from present-day forests? Very little, except that each acre will support more and better trees, and more hardwoods may be mixed in with the pines. Broadened markets and improved utilization practices will offer outlets for material that is now wasted. There will be general recognition of the public values attached to forests, if we are to judge by the experiences of the nations which have been caring for their forests for centuries past.

Only an optimist of the most visionary type will expect these things to take place overnight, or to come about without conscious planned effort on the part of man. If we are to make the most of our Piney Woods, we must build up and put into practice a knowledge of forest

growth, protection, management, utilization and economics, the development of which is still in its infancy.

Here is where research comes into the picture, offering an almost unlimited field for useful investigations. Since 1921, the federal government has conducted a certain amount of forest research at the Appalachian and Southern Forest Experiment Stations, and since 1910, research on wood and forest products has been under way at the Forest Products Laboratory at Madison, Wisconsin. Some forest research has also been done by the states and at forest schools.

Wildfire! Improved techniques resulting from research in fire behavior and control are helping reduce damage from this scourge of the Piney Woods

Among the many practices based on research findings which already have been adopted advantageously by progressive forest owners and operators are the following: improved techniques in seed procurement, nursery, and planting practices; methods of thinning, improving, and harvesting timber stands that assure natural reproduction, increased growth, and profitable returns; improved fire protection techniques; and more conservative methods of extracting naval stores—turpentine and rosin—from longleaf and slash pines. Many landowners are ready and willing to accept better methods of handling and using their timber crops as soon as they are convinced of the practicability and profitableness of doing so.

Let us consider a few of the avenues along which forest research can best render service to the Piney Woods landowner and to the public. The Forest Survey reveals that about sixty percent of the volume of all trees in the South over five inches in diameter is in hardwoods, some in intimate mixture with the pines, some in pure stands off to themselves. Over half of this hardwood volume, because of size or quality, is not readily merchantable, even in wartime, and finds little or no profitable utilization. If a profitable means could be found to remove this material from the woods, it would allow growing space for more valuable trees, thus improving the growth and income possibilities of the stands.

At present, there is too much waste in forestry operations, both in the woods and at the mill. This challenges research to develop improvements in logging and milling methods to reduce waste and to devise new industrial uses for the irreducible remainder. Some advances have been made, but much more needs to be done to solve these problems.

The further development of cellulose chemistry offers great promise to the Piney Woods region. Acre-for-acre, trees can produce greater quantities of cellulose at less cost than can cotton fields. And the fact that southern forests cover about thirteen times as much land area as does cotton is indicative of the potentialities of these woods for cellulose production. Some say that the age of plastics is just around the corner, and that cellulose products in an endless variety of shapes and patterns will be made from all kinds of woody material. When that time comes, the southern Piney Woods will be in its glory. The most recent straw in the wind is a proposal to make ethyl alcohol from southern pine logging and mill waste, and here again research must point the way.

The South now supplies most of its forest products to other sections of the country in rough form, such as lumber and wood pulp. What the South urgently needs is an expansion in the number of manufacturers of highly processed, finished consumer goods such as newsprint and other papers, furniture, plywood, plastics and chemically converted products, prefabricated houses, millwork, and so on—not only to fill its own needs but also for export to northern and eastern markets. Research in this field will help provide local markets with forest products and will increase the opportunity for local labor at good wages.

With per capita paper consumption on the increase in this country, there should be further opportunities for growth of the pulp-using industries in the South as soon as the war ends and new plant construction is possible. Of

course, this growth should be guided by careful consideration of the quantity, quality, and availability of pulpwood, the effect on the raw material supplies required by other forest-products industries, and with due regard to long-time investment factors. It is also contingent upon maintenance of the marked advantages of the South over other regions of the United States and foreign sources in respect to costs of wood and other raw materials and of the manufacturing operations. One of the most hopeful aspects for the expansion of the pulp and paper industry in the Piney Woods lies in the opportunity it offers for the utilization of low-quality wood grown as a byproduct to higher grade materials for other forest industries.

Since 1940, newsprint has been made successfully from southern pine at a mill in east Texas. Also, high-grade sulphite pulp is made from southern pine in northeast Florida. Most southern pulp mills, however, use the sulphate or kraft process, and many of

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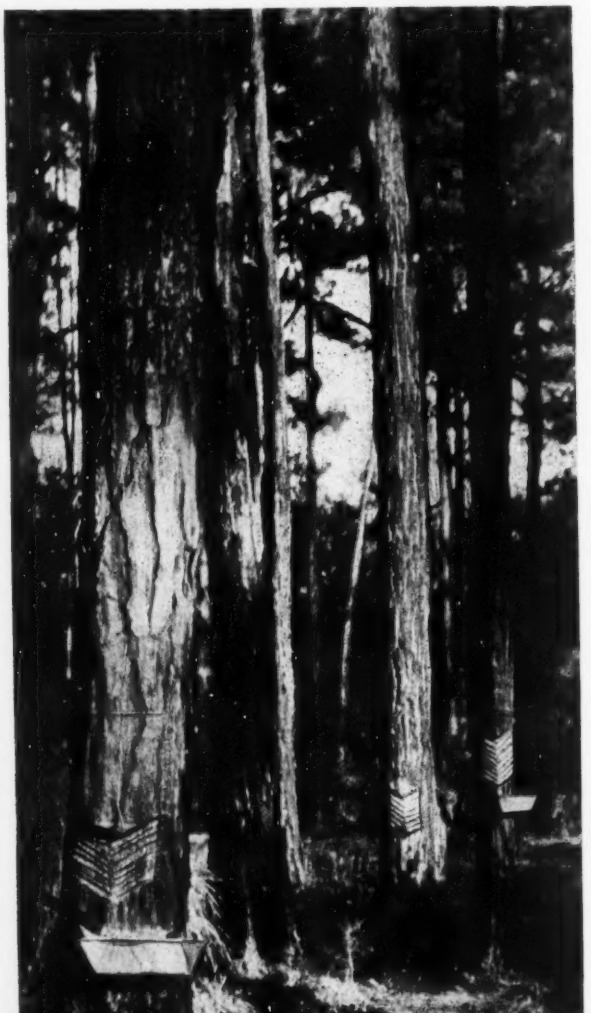


Research, the foundation of naval stores conservation programs, is pointing to future practices

Markets for low-grade hardwoods offer opportunities to increase profits. It is a job for research

THE FOREST APPRAISAL AND THE SOUTH

By JOHN B. WOODS

A QUARTER century ago the vast Southland was *terra incognita* to most foresters. It was a region of plantations and small farms, running rather heavily to cotton fields. Yet a considerable portion of the total area was cutover land, from which the ripe timber had recently been removed.

When foresters began to get acquainted with the South, in the years after World War I, some of the more observant noted a disquieting sense of impending disaster. Here and there were deserted sawmill and logging camp towns, testifying to the exhaustion of primeval forests. Equally disheartening, over large sections abandoned tillage lands advertised the decline of soil mining agriculture. The saving feature was that during this period of change, billions of trees were germinating and pushing their tops toward the sun.

Before long, several things happened. Governmental and commercial agencies began to do things for southern landowners to help them live without cotton crops. New forest industries which could subsist upon wood from young trees moved into the region. Federal and state governments launched programs of land acquisition, with the object of blocking up permanent public forests. These agencies also began spreading the gospels of forest protection and careful harvesting of tree crops.

Forestry gained recognition as a pillar of the South's economy, only slightly less important than agriculture. In fact, the two activities came to be regarded as inseparable, since tree growing was so often the farmer's major side line.

Great things still are happening in this vast region. Yet today, after more than three years of wartime strains upon southern forests, we are in the unfortunate situation of not knowing enough about their extent and condition. Many people fear that these growing stands have been well-nigh ruined since 1941. Nobody knows for sure.

Back in the nineteen-thirties the federal Forest Service inventoried the standing timber of the coastal plain and Mississippi delta regions. The work was carefully done and its results certainly were reliable. On the average they now are about ten years old.

Efforts have been made to keep such volume figures "current," by adding annual growth and deducting yearly cuts. Yet it is likely that errors have crept in. Storekeepers who keep "progressive" inventories tell us that stocks of goods on their shelves never add up to equal book inventory figures arrived at by such a method. So it may be with living timber stocks.

A vast wood-producing plant is the Piney Woods. How is it being managed?

The war has interfered with this "keeping current." Since Pearl Harbor, the personnel of the Forest Survey has been at the disposal of the War Production Board, aiding in divers ways to locate sources of needed forest products and to speed their entry into the war effort. Truly a great deal has been done to broaden and improve the collection of "drain" or forest harvesting statistics. Yet field studies of growth rates and of the extent and severity of cutting, have necessarily been allowed to lag.

The Forest Resource Appraisal, undertaken by The American Forestry Association, is a country-wide effort to review forest survey findings and all other available data and to put together a picture of what has happened to our growing timber stands since January 1, 1941. At the same time we expect to make estimates regarding the abilities of these stands to supply usable wood during the next decade.

Such a study has special meaning to the South. Here is a vast wood-producing plant which needs only reasonably intelligent forest management to yield as much timber out of *yearly growth* as ever came out of its primeval stands during a twelve-month. How are these forests being managed today?

The South is capable of producing the 4,000,000 wooden poles normally used each year to maintain and extend the services of our public utilities. Are these future poles growing there now? If so, how good are their chances of escaping the pulpwood cutter's saw and of being allowed to grow to pole size?

Enthusiasts declare that the forest extension work done during the past decade has produced highly significant results. If these facts are as striking as claims being made, it is high time that they be brought to public attention.

How do southern people generally feel about burning the woodlands? A vast portion of the South does not enjoy "organized" protection. Possibly the whole problem of fire prevention needs cold-eyed scrutiny, frank discussion, and action. If southerners are as forward looking in this as in many other things, they may be ready to "go to town." But first, they need more facts.

Space does not permit much in the way of details as to how this job will be done. The help of every southern state forester has been sought, and promised. Federal agencies are cooperating to the fullest degree compatible with their war obligations. Perhaps the most promising approach to the task is the availability of aerial photos to serve as bases for type-mapping. Field work was started in Georgia during March, with beginnings made in two other southern states during April. These are the necessary "test runs" to try out methods and train personnel. Once started we expect to keep going until the field work is complete for all regions.

CATTLE IN THE PINES

Once Viewed as an Unnecessary Evil, Piney Woods Grazing is Emerging Under the Stimulus of Research and Management as an Important Forest Industry

By R. S. CAMPBELL and H. H. BISWELL

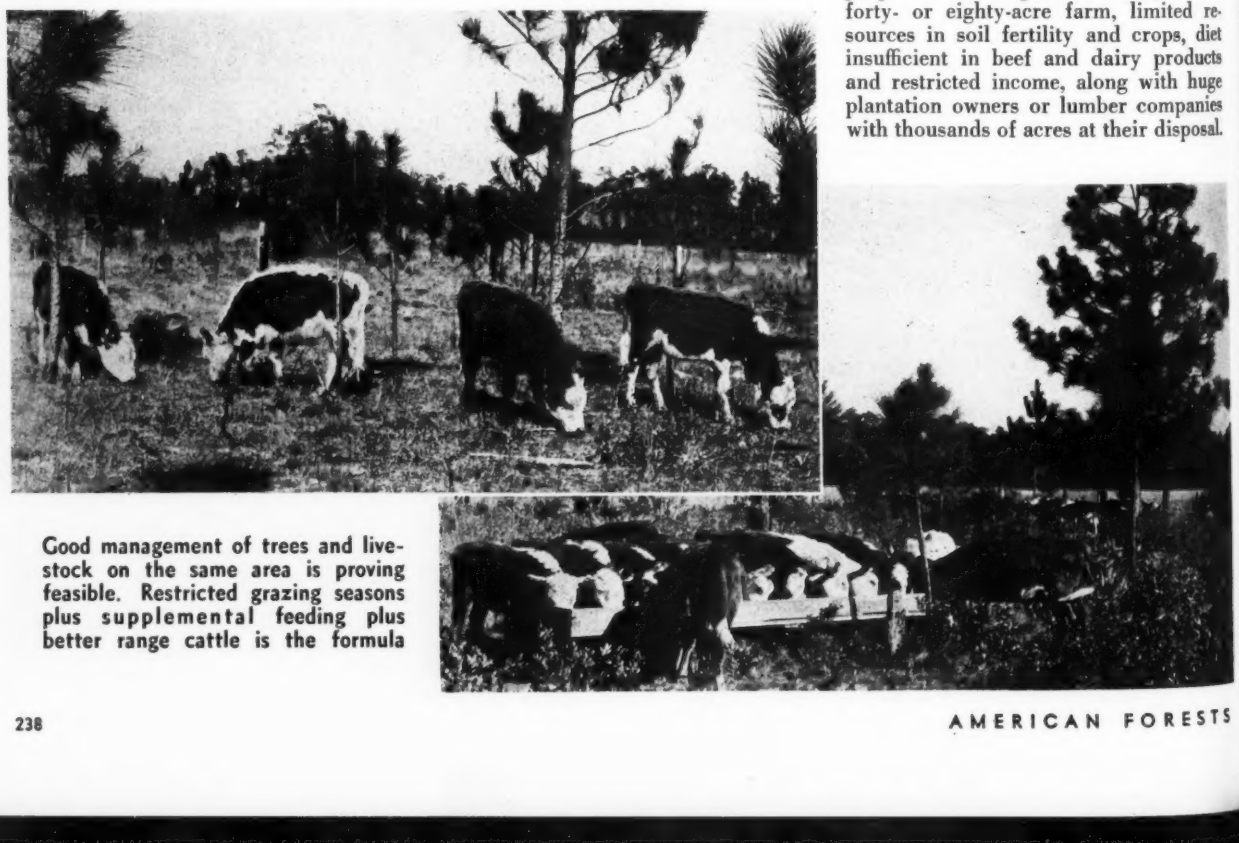
PINEY WOODS cattle grazing is an important wartime industry. In the Atlantic and Gulf Coastal Plain area there were, on January 1, an estimated 7,500,000 cattle and calves, an increase of twenty percent in a half decade. These animals, the bulk of which graze on forest range during at least part of the year, produced in live weight the equivalent of nearly half the nation's beef demands for military and lend-lease. In addition, the forest supplies forage for a large part of 1,000,000 sheep in the area.

A few years ago foresters would have ridiculed the idea of such production; even now, people unfamiliar with conditions in the South are inclined to deride southern forest grazing as an existing but unnecessary evil involving only scrub cattle owned by backwoodsmen who burn other people's woods to freshen up the grass. It is true that until a decade or so ago cattle in the Piney Woods were mostly native scrub stock, producing paltry calf crops with exorbitant losses. But this has changed. Today cattle on southern forest ranges are contributing a substantial share of livestock production—and therein lies a story of steady progress in research, education, public assistance and private initiative.

The southern range livestock industry did not grow up overnight. Neither is it the simple métier of the settlers who brought their half-wild Spanish cattle to the shores of Amichel (Gulf Coast) in the eighteenth century, and could "live and let live." It requires making the best use of hundreds of species of luxuriant grasses, weeds and shrubs—the familiar "rough" of the Piney Woods. It involves a thrifty and fecund type of animal, adapted to the hot, humid weather and usually low nutritional level. It means major adjustments in farm management to produce the increasing amounts of pasture, hay and concentrates needed to keep animals well fed and healthy, particularly during seasons when the forest range furnishes only a below-maintenance diet. It involves coordination with wildlife, the hunting and fishing so important to every southern farm boy—and his daddy. The same land that is grazed must be protected from careless burning, restocked by natural seeding or planting, with the stand improved to produce such quantities of pulpwood, ties, poles, piling, sawlogs and naval stores as only the United States could dream of processing for wartime use or for rebuilding homes and factories during years of peace.

The quickened interest in forest grazing and the many problems involved have led to the beginning of range research by the regional forest experiment stations of the U. S. Forest Service, in cooperation with other federal research bureaus and the state experiment stations. Such studies already under way in the Coastal Plain of North Carolina, Georgia and Louisiana are showing that the problems of livestock raising in relation to forestry and farming are far from unsurmountable.

The most important detail in any picture of the southern forest range is its people—the average farm family with a forty- or eighty-acre farm, limited resources in soil fertility and crops, diet insufficient in beef and dairy products and restricted income, along with huge plantation owners or lumber companies with thousands of acres at their disposal.



Good management of trees and livestock on the same area is proving feasible. Restricted grazing seasons plus supplemental feeding plus better range cattle is the formula

Research is revealing that under proper conditions southern forest grazing reduces the fire hazard. Excessive grass fuel is eliminated and fires burn with less intensity and are easier to control

As would be expected in a forest region, grazing is complementary to the growing of wood products. Farm woodlots, making up nearly a third of the forest area, not only produce fuel and fence posts for the farmers' own use, but even now are the center of a nationwide drive for increased production of pulpwood. The remaining two-thirds of the area, with the exception of the five percent in public ownership, are largely in small, individual private timberland holdings, mostly second growth. Few of these owners fence the land or run cattle of their own. This permits a free range industry that began long before the old public domain grazing of the West, and causes many more problems in land control and use.

The dilemma of absentee ownership of large acreages and the restricted opportunity of the small farmer to make a living gravely handicap the application of improved management methods. Better control, through fencing and land management, is needed both for the forest and for the animals. County by county, fence laws are slowly setting the stage for such control. In addition, study of forest grazing in Louisiana in 1943 revealed at least one way in which stockmen are overcoming the difficulty. In several cases, farmers arranged with landowners to fence and graze up to 1,000 acres of forest land in return for protecting the area from fire and trespass. Such resident use and protection may offer the beginnings of restoration and more intensive management for large bodies of forest land now lying idle.

But good management of trees and livestock on the same area is beset by problems. Many foresters hold livestock responsible for serious damage to trees. However, repeated observations have demonstrated the selective grazing ability of cattle—the dexterity with which they eat the grass from around longleaf and slash pine seedlings without disturbing the young trees. Cattle admittedly browse on seedlings and sprouts of valuable hardwoods in the Mississippi Delta and other bottomlands. A study of sheep grazing on the Desoto National Forest in southern Mississippi, revealed serious damage particularly from eating out the buds of longleaf and slash pine seedlings, but mainly during the winter and early spring when there was little other green vegetation. Who knows but that future research may work out improved methods of grazing both pine and hardwood types with cattle, sheep and perhaps even goats that will be entirely compatible with good forest management, just as has been done frequently on the western range?

Progressive forest landowners for decades have been interested in cattle as a means of consuming much of the "rough" and reducing the fire hazard. Foresters report that fires in grazed areas do not burn with as much intensity and are easier to fight than on ungrazed ranges. The consensus of interviews with more than 300 farmers in the Coastal Plain of North Carolina, Georgia and Louisiana shows that the grazing of cattle on forest range reduced the fire hazard from twenty-five to fifty percent. Reduction takes place through actual eating and trampling of potential grass fuel, and by impelling a change to a less combustible plant type.

The McNeill, Mississippi, study of the Southern Forest Experiment Station has demonstrated that close grazing kills out coarse wiregrasses and encourages the spread of plants with less hazard, such as carpet grass.

Farmers frequently report that young pines grow faster on grazed than on ungrazed forest areas. Grazing appears to be a successful way of reducing grass competition and leaving nutrients, moisture and sunlight for the seedlings. Excessive trampling, of course, especially in small farm woodlots, may greatly retard the growth of young pines.

Farmers interviewed in North Carolina, Georgia and Louisiana were almost unanimous in their opinion that indiscriminate fires damage both the trees and forage. In fact, the LaSalle Parish

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PATHFINDERS IN SOUTHERN FORESTRY

Brief Tributes to Ashe, Herty, Cary, Hardtner and Mattoon — Whose Names, Among the Many Who Helped Blaze the Way, Will Live On

W. W. Ashe

W. W. ASHE

By L. F. KNEIPP

THE average man, perhaps the average forester, is apt to think of the Appalachian hardwood and southern pine forests in terms of a score or two of the tree species of greatest utility and commercial importance, plus a few other species that capture attention by their beauty of form, foliage, or flower. W. W. Ashe, whose association with the U. S. Forest Service in the South and East covered a long span prior to his death in 1932, had a different concept of those forest regions. He thought of them in terms of 150 or more major species of trees, hundreds of species of lesser arboreal form, and thousands of species of smaller forms of plant life. Each he knew intimately, lovingly and well—knew its ecology, its associations and its habits of growth. To him the forest was not so much a potential source of boards, timbers, or pulpwood, as it was an intricate biological complex in which the part and place of each member of the association had its definite significance. It was this understanding and knowledge that ranked him as the leading dendrologist, the leading authority on forest trees found east of the Rocky Mountains.

A motor trip through a forest with Ashe was a unique experience. With the car moving at a speed of forty miles an hour, wayside plants to the average eye were somewhat blurred. But not so with Ashe. Absorbed in thought, apparently half somnolent, he would suddenly see something of interest and his exclamation would bring the car to a skidding stop. Walking back fifty to a hundred yards, he would turn off into the brush to emerge shortly with a specimen of a plant needed to supply a certain deficiency in his collection. At dusk one rainy evening, and with curtains up on an open car, he spied fifty yards off the road a rare tree species he long and fruitlessly had sought throughout the South.

But Ashe was more than a botanist and dendrologist. His field of forest knowledge comprehended not only the play of natural forces but also the play of economic forces; in some lesser degree the play of political forces. He was a realist, with a definite conviction that unless benefits at least aggregated the costs the merit of a proposal was debatable. He was neither a "lyric" forester nor an "economic" forester, but rather one who believed that in forestry, as in all other affairs of men, human action should be guided by the rules evolved through human experience, with due regard to the intangible as well as the monetary consequences. The end toward which he bent his efforts was the formulation of a set of principles under which men could occupy and fully enjoy the field of nature without unduly impairing its equilibrium or destroying its potentialities for human service.

His was not an impressive personality nor was he efficient as a self-advertiser. The fact that his academic training and technical experience had not been wholly orthodox inspired attacks on his findings—attacks which deterred him from making other contributions he might well have made.

When a southern lumberman once urged Ashe to publish for slash pine technical notes similar to those he had published for longleaf pine, he observed that he had no desire to again court criticism such as his longleaf pine notes had provoked. Nevertheless, Ashe was one of the major influences for better forestry in the United States, particularly in the South. People came to know him as sound, sane and especially qualified—to appreciate his genius and to have confidence in his conclusions. He sought no magic formulas, worshipped no false gods, advocated no synthetic theories or "isms," voiced no disparagement of free enterprise, showed no scorn for invested capital. His fame as a prophet spread slowly but once established it persisted and men listened to his words, and his quiet and unobtrusive furtherance of the forestry movement in the United States contributed immeasurably to its progress.

DR. CHARLES H. HERTY

By JAY WARD

Dr. Charles H. Herty

IT was not my good fortune to have had an intimate acquaintance with Dr. Charles H. Herty. I first heard of him during the summer of 1923 at the University of North Carolina where for many years he had been head of the department of chemistry. Here he had left behind him a host of friends among the faculty and former students. A short time later it was my privilege to meet him in New York and to get first-hand an inkling of the high purposes which motivated his whole life. In the years to follow I had many meetings with him

in Georgia as well as in Washington, D. C.

In my work with the government, devoted principally to naval stores, I was bound to take note of the very substantial contributions made by Dr. Herty without which it is doubtful if the naval stores industry in America could have survived.

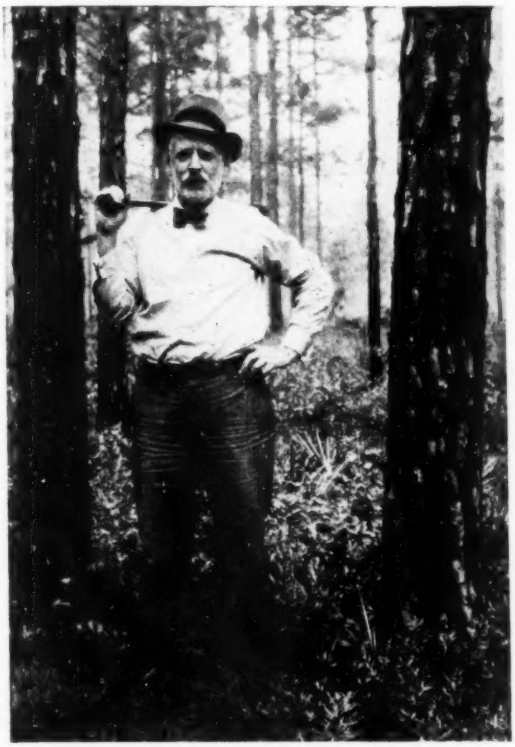
Around the turn of the century, when the original growth of turpentine pines was fast disappearing in the path of the sawmills, it became evident that the old "boxing" system for naval stores production could not long be continued. As far back as the middle of the nineteenth century experiments had been made for the purpose of providing a substitute for the box, but these efforts were not sufficiently sold to operators generally, and were abandoned.

Upon the premise that "turpentine gathering, as now conducted in the United States, is needlessly destructive of the forests and needlessly wasteful of the product," Dr. Herty began, during the spring of 1901, a careful study of conditions in the Georgia pine forests, visiting various points in the turpentine belt and conducting an extensive correspondence with turpentine farmers and others interested in naval stores. A limited experiment was conducted during the summer in the application of the cup and gutter system of turpentine operation. This led to Dr. Herty's acceptance of a commission from the Bureau of Forestry in the Department of Agriculture to conduct more extensive investigations and experiments in a selected area of Georgia, which began February 1, 1902.

A bulletin published by the Bureau in 1903 contains a detailed report of these experiments and clearly indicates the thoroughness as well as the patience and persistence which characterized Dr. Herty's work in his every field of effort. Unlike earlier experimenters, he followed through on the job, and as a result the cup and gutter system, which he so expertly demonstrated to be more economical from every standpoint, was generally adopted before many years by turpentine farmers.

Dr. Herty was a rare combination of scientist and super-salesman. He did not dream and let it go at that. He did not solve problems in the laboratory and lock up his findings in a vault. He let his light shine for all to see and enjoy. He believed that knowledge is power only when it is shared and put to use. Despite his many accomplishments he was very modest. I recall on one occasion his embarrassment when accredited with certain scientific discoveries which originated with someone else. Yet it was he who took these ideas, put wheels under them and made them roll.

Charles H. Herty, who at the time of his death in 1938 was director of the Herty Foundation Laboratory, did not seek riches for himself. Rather, his ideal was to so serve his generation that better homes, better food and better clothes could be provided for the poorer families of his beloved Southland. He lived hurriedly, without ever giving the impression of haste or impatience; he lived heartily, finding and sharing enjoyment in all phases of his work and play; he lived fully, striving always, through the application of his many talents, to increase the blessings of all his fellowmen.



Austin Cary

AUSTIN CARY

By A. B. HASTINGS

FOR almost half a century Austin Cary was a potent factor in American forestry thought and action. His field activities, first devoted to his native woods of Maine, were later concentrated upon the Piney Woods of the South, which was to him the forester's land of promise.

His career was comprehensive to a degree which few foresters can equal. Educator, industrial forester, state forester, and for the last quarter century of his life logging engineer for the U. S. Forest Service, he was also a forest land owner. Among woodsmen, his "Manual for Northern Woodsmen" was a best seller. His technical papers and other publications were prolific and substantial.

Austin Cary was a scholar. Graduated from Bowdoin College with honors in 1887, and later the recipient of the degrees of Master of Arts and Doctor of Science from that institution; a graduate student at Johns Hopkins and Princeton; a teacher of forestry at Yale and Harvard; three times a visitor and student of forestry in Europe—yet how simple, practical and modest was the application of his learning. He spared no pains to "cut through" to reality in every forestry problem with which he was confronted. If it required time, he gave it time.

In his quiet way, Austin Cary was often called a circuit rider for forestry. His background of experience, gleaned in many forests, was tempered by the more personal knowledge that comes with ownership, for he stood among the few foresters who showed their faith in forestry by investing their own savings in forests. Consequently, timberland owners throughout the South and East welcomed his practical counsel.

His was a rugged personality, and he was an individualist, impatient with such of the proposed public controls which seemed to him unnecessary or inadvisable. His disregard of some of the conventions of society delighted and occasionally embarrassed his associates. He held firmly to his considered opinions but not with arrogance nor without regard for the policies of his employers, and with the respect of his associates, including those with whom he may have fundamentally differed.

A keen observer, he carried on his own multitudinous investigations, the results of which were promptly utilized. His tools were few, his methods were simple, he asked none to follow blindly, but his influence on timberland owners toward improved forest practices was great in translating ideas into action.

Following his death in 1936, it was a matter of real satisfaction to Austin Cary's friends that this sincere man who abhorred "ballyhoo" should have dedicated to him by the Society of American Foresters a living memorial—a forest of slash pine—the tree with which he had accomplished so much, the Austin Cary Memorial Forest in custody of the University of Florida Forest School.

Henry E. Hardtner

HENRY E. HARDTNER

By WILSON COMPTON

AMONG the many men who have contributed to the advancement of sound forestry in America, none can be more suitably described as a pathfinder of progress than the late Henry E. Hardtner of Urania, Louisiana.

When Henry Hardtner began logging in Louisiana just before the turn of the century, he followed the customary clear-cutting practices of the time. Great quantities of virgin timber were standing, not only in that state but in many places where the original timber had been cut. But generally they felt no basis for personal interest in it. Henry Hardtner was one of the exceptions.

By 1904, he had decided to conduct some experiments at his own risk and expense to learn whether it would be financially practicable to manage a forest so that timber could be grown and harvested in successive crops. Fencing off a number of test plots, he experimented with the effects of fire, the amount of damage by animals, and the rate of wood growth under varying conditions.

Simultaneously, he abandoned clear-cutting of his timbers and required that a sufficient number of seed trees should be left standing wherever logging was done, to provide for more rapid regeneration of new crops. A little later, he added the practice of limiting the cutting of timber to a twelve-inch diameter. This soon evolved into selective cutting which considered each tree on its individual merits.

How well these practices worked is shown by the results on a typical tract of eighty acres, where only seed trees had been left standing when it was logged in 1903. When that tract was logged again by the Urania Lumber Company, just thirty-seven years later, the new crop yielded 105,000 board feet of pine lumber, 141,000 feet of hardwood lumber, and sixty-one cords of pulpwood, in addition to which there was still left standing an estimated 445,000 feet of pine, 33,000 feet of hardwood, and eighty cords of pulpwood, not including seedlings and saplings too numerous to count.

Henry Hardtner was a pathfinder, however, not only because he taught scientific forestry to himself, but because he was one of the South's great missionaries of forestry. Traveling widely, he told the story of his experiments to thousands of friends and acquaintances. Many of them were quick to accept his urging, and as they copied his methods, they also became forestry missionaries.

An automobile accident cost Henry Hardtner's life in 1935. But throughout the South, the memory of what he did to help show the way in good forestry is still fresh, and his lumbering enterprise still carries on. There could be no finer monument to him than the millions of acres of thrifty second-growth timber on lands managed by friends of Henry Hardtner whom he had encouraged to accept the belief that "timber is a crop."

WILBUR R. MATTOON

By W. K. WILLIAMS

WILBUR R. MATTOON was a kindly gentleman, a scholar, and an able forester. For a quarter of a century, up to his death in 1941, he worked continuously in the field of private forestry, largely in the South. He visualized the opportunities in farm forestry and was thoroughly imbued with the promise it held for greater security and better living.

He was a modest man, yet zealous and untiring in his efforts to encourage the practice of forestry by woodland owners and to assist agricultural leaders with the development of programs which included the growing of timber as a crop. As one man said: "It was not so much the trees he planted as the thoughts he planted in the minds of common people."

One of the earlier graduates in forestry, receiving a Master of Forestry Degree at the Yale School of Forestry in 1904, "Matty," as he was often called, was a pioneer in forestry. When he started work in the South there were only two state forestry departments, very few technical foresters, and little thought had been given to farm forestry. Some of the first work carried on by Mattoon included studies of the history and management of the more important southern commercial trees such as longleaf, loblolly, shortleaf and slash pines.

He was the first person to recommend second-growth slash pine for practical forest management. Foresters and landowners recognized the soundness of his advice and joined in advocating management on a commercial scale. He became so interested in and enthusiastic about the possibilities of this species for rapid growth and for the production of turpentine and timber products, that he was dubbed by some southerners the "daddy" of slash pine.

The first experiments in the South on reforestation by artificial means were begun by Mattoon about 1912. He made the original study and plan for cooperative experimental work on lands owned by Henry E. Hardtner of Urania, Louisiana. He also had an important part in

(*Turn to page* 265)

Wilbur R. Mattoon

Stripped of wings, gun turret, engines and machine gun, this R. C. A. F. bomber is on its way to a repair depot. Ahead lies 14 miles of wilderness. The "prime mover" on this job is the rugged International TracTracTor.

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The operation took a large crew five weeks to complete, but it was worth it. And when the day came to start pulling the bomber out, an International TracTracTor furnished the towing power over the temporary road.

Getting the bomber off the ice, weakened by the spring thaw, was as much of an engineering problem as the building of the road. Holes were cut in the ice and 56-foot tree trunks were sunk 23 feet to the lake bottom. The bomber was strapped to the poles and floating wooden platforms built.

Airmen then dismantled the bomber—first the machine gun, then the gun turret, the wings and the engines. Wooden sleds carried this equipment across the ice to the camp site.

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LITTLE-LEAF—A SHORTLEAF AND LOBLOLLY PINE PROBLEM

Science is Working on This Destructive Disease, the Cause of Which is Yet Unknown

By GEORGE H. HEPTING

AN unexplained dying of pine, largely in the Piedmont region of the Southeast and in the upper Coastal Plain of Alabama, has attracted attention in recent years. Many trees that have grown normally for twenty or more years slow down markedly in height and diameter growth, the needles develop shorter and more yellowish each year, and twigs die throughout the crown, particularly in the lower portions. After from three to fifteen years of progressive weakening, the trees die. This combination of decline and premature mortality has become known as the little-leaf disease.

Little-leaf as it appears in the Piney Woods. Shortleaf pine at left is in the advanced stage of the disease. Tree at right shows no symptoms

Little-leaf affects primarily shortleaf pine, to a lesser extent loblolly, and occasionally Virginia pine. A few cases of a similar disorder have been found in longleaf, although this trouble may be distinct from little-leaf. The disease occurs in a belt running through the Piedmont from central Virginia to northeastern Mississippi. Major affected areas occur in central Virginia, all through the South Carolina Piedmont, in a few Georgia and Tennessee counties, and over the northern half of Alabama. Less severely affected areas are scattered throughout the Piedmont.

Little-leaf has been under intensive investigation by the Division of Forest Pathology, U. S. Department of Agriculture, for three years, but the cause has not yet been determined. Causation studies have been directed chiefly at weather, soil fertility, minor element deficiencies, root fungi, and virus possibilities, with many other phases receiving attention.

Stands that break up from little-leaf are usually between thirty and fifty years old, and never under twenty years. The disease can be separated from the effects of bark beetles, drought, fire, or other known causes of pine mortality, by the progressive annual decline of the tree, the small tufts of foliage at the twig ends, and usually by the short yellowish foliage and very minute annual rings for the last few years prior to death. On the average, seven years elapse between the time the earliest crown symptoms become apparent and a tree dies.

A special type of forest management is required for areas in which little-leaf is a problem. This management must be based upon (1) recognition of the disease; (2) prompt salvage of diseased trees; (3) wherever feasible, short intervals of about five years between cuttings to harvest the trees that have come into little-leaf since the last cutting; (4) adoption of a rotation age probably not to exceed fifty years on bad little-leaf areas; and (5) development of a market based upon small products, such as pulpwood, poles and fuel.

Millions of board feet of shortleaf and loblolly pine timber are now severely affected with the disease, and there is evidence that it is increasing its range slightly in some localities. Studies have shown that where it does occur it is definitely getting worse.

This timber should not be allowed to rot on the stump. Particularly good opportunities for the salvage and marketing of affected timber are offered at the present time. There is a critical shortage of pine pulpwood, and the demand for lumber and crossties is at a peak. Prompt cutting of trees affected with little-leaf will save them from early death and decay in the woods. Trees cut now will bring a higher price than has prevailed in many years, and will help alleviate the shortage of pine pulpwood now plaguing the southern pulp mills turning out packaging materials for our armed forces.

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New Contributors to the Forest Resource Appraisal

AS OF April 28, contributors to the Forest Resource Appraisal of The American Forestry Association numbered 420. Of these, 313 were individual contributors, eighty-nine industrial companies, and eighteen conservation and trade associations. Of the $250,000 needed to complete the Appraisal on the basis originally planned, approximately $200,000 has been underwritten.

Lists of contributors were published in the January, February and March issues. Since then, subscriptions have been received from the following:

Mrs. Donald Putnam Abbott, San Diego, Calif.; W. R. Abbott, Melbourne, Fla.; Shirley W. Allen, Ann Arbor, Mich.; Association of American Railroads, Washington, D. C.

Frederick A. Ballou, Providence, R. I.; Mrs. Thomas F. Bayard, Wilmington, Del.; Mrs. John W. Blodgett, Jr., Grand Rapids, Mich.; Mrs. Nancy Earle Bomar, Auburn, Ala.; Dr. John W. S. Brady, Spokane, Wash.

California Forest Protective Association, San Francisco, Calif.; Miss Gail Calmerton, Los Angeles, Calif.; Mrs. C. M. Casselberry, Newton, Mass.; The Chesapeake Corporation of Virginia, West Point, Va.; Mrs. Moses H. Cone, Baltimore, Md.; Conservation Association of Southern California, Los Angeles, Calif.; Consolidated Timber Company, Portland, Ore.; Charles P. Cooley, Hartford, Conn.; Mrs. S. V. R. Crosby, Boston, Mass.

Denkmann Lumber Company, Canton, Miss.; Dennison Manufacturing Company, Framingham, Mass.; Miss Louisa Dieckmann, Cincinnati, O.; Miss Florence S. Dustin, Cambridge, Mass.

Miss Mabel L. Earle, Lynn, Mass.; Glenn W. Eaton, Jr., Grand Haven, Mich.; Ecusta Paper Corporation, Pisgah Forest, N. C.; Thomas A. Edison, Incorporated, West Orange, New Jersey; Mrs. H. P. Erwin, Washington, D. C.

O. R. Fahey, The Birches, Me.; E. B. Fletcher, Mifflintown, Pa.; Miss Elizabeth W. Frothingham, Tarrytown, N. Y.

Mrs. D. P. Gaillard, Washington, D. C.; Gaylord Container Corporation, St. Louis, Mo.; Mrs. Otto Gerdau, New York, N. Y.; Miss Theda Gildemeister, Hillsboro, Ill.; Mrs. Paul Gottheil, New York, N. Y.; Gurdon Lumber Company, Inc., Gurdon, Ark.

Mrs. Morris Hadley, New York, N. Y.; Mrs. J. Morton Halstead, Suffolk County, N. Y.; Harrisville Combing Mills, Inc., Harrisville, R. I.; Mrs. Conrad P. Hatheway, South Lincoln, Mass.; Theodore W. Herbst, Bernardsville, N. J.; Christian Heurich, Washington, D. C.; Mrs. Charles V. Hickox, New York, N. Y.; Homasote Company, Trenton, N. J.

Mrs. Eli Lilly, Indianapolis, Ind.; Mrs. Alan Limburg, Windsor, Mass.; Longview Fibre Company, Longview, Wash.

Miss Ethelyn McKinney, Greenwich, Conn.; Macon Chamber of Commerce, Macon, Ga.; Second Lt. David Cutter Martin, New York, N. Y.; Massachusetts Forest and Park Association, Boston, Mass.; Mrs. K. F. Merle-Smith, Long Island, N. Y.; Mississippi Forestry and Chemurgic Association, Inc., Jackson, Miss.; T. J. Moss Tie Company, Inc., St. Louis, Mo.; L. T. Murray, Tacoma, Wash.; C. N. Myers, Hanover, Pa.

National Container Corporation, Jacksonville, Fla.; North Idaho Forestry Association, Lewiston, Idaho.

Pacific Marine Supply Company, Seattle, Wash.; Penobscot Chemical Fibre Company, Boston, Mass.; Mrs. Vanderbilt Phelps, Monterey, Calif.; Mrs. W. E. Prentice, Batavia, N. Y.; Dr. Helen C. Putnam, Providence, R. I.

Mrs. Peter Reiss, Sheboygan, Wisc.; William A. Rockefeller, New York, N. Y.; Row River Lumber Company, Portland, Ore.

Miss Ellen D. Sharpe, Providence, R. I.; J. H. Sherrill, Pensacola, Fla.; Southern Wood Preserving Company, Atlanta, Ga.; Mrs. Henry Alvah Strong, Winston-Salem, N. C.

Mrs. Thomas Taylor, Columbia, S. C.; Mrs. Ezra Ripley Thayer, Boston, Mass.; Miss Elizabeth Thomas, Cleveland, O.; Harold E. Thomas, Gloucester, Va.; Mrs. Carroll S. Tyson, Jr., Chestnut Hill, Pa.

Uptegrove Lumber Company, Newark, N. J.; Mrs. Henry G. Vaughan, Sherborn, Mass.

Western Management Company, Portland, Ore.; Miss Edith Wetmore, New York, N. Y.; William Williams, New York, N. Y.; Lt. Col. Herman Work, New York, N. Y.; Wright-Blodgett Company, Ltd., Portland, Ore.

Richard Lieber Dies

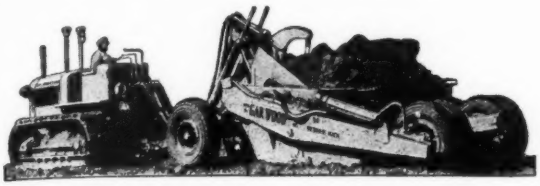
RICHARD LIEBER, nationally known conservationist, and father of the great Indiana state park system, was stricken fatally with a heart attack on April 15 at McCormick's Creek Canyon Park. Though seventy-four years old, he was apparently in the best of health and his sudden death came as a great shock to his associates.

Attending military school in Germany, Mr. Lieber revolted against Prussian methods and left the country, engaging in social work in England and then, when still a very young man, came to America. He traveled widely in the West and, deciding to stay in this country, settled in Indiana.

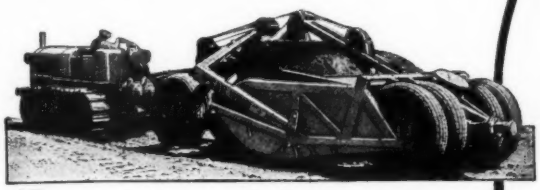
His profound interest in conservation had its genesis in the now famous first Conference of Governors called to the White House by President Theodore Roosevelt in 1908. In 1912 he was active in the Fourth National Conservation Congress and in 1915 became chairman of the Indiana State Park Committee. Two years later he was secretary of the State Board of Forestry and in 1919 became the first director of the newly created Indiana State Department of Conservation, a position he held until 1933. In 1921, Mr. Lieber helped the late Stephen T. Mather, then director of the National Parks, in organizing the National Conference on State Parks, and served as president of the Conference from 1932 to 1939.

As director of the State Department of Conservation of Indiana he was tireless in his work. He loved nature in its wild, untrammeled state—and looked upon the wilderness as a sacred heritage. Once he said: "The unbroken wilderness is the best sermon on Americanism. . . . We all hunger for the natural and the spiritual, so let us seek it out in the undefiled wilderness, but — remember you are not the heir but the steward of a great inheritance to be handed over to posterity." His book, "America's Natural Wealth" —though first and foremost a work on conservation, revealed his deep love for his adopted country.

Always proud of his state, Richard Lieber will go down in the history of Indiana as the father of her state parks. His vision and labor truly brought them into being, and they will stand an everliving memorial to a kindly man and a great conservationist.

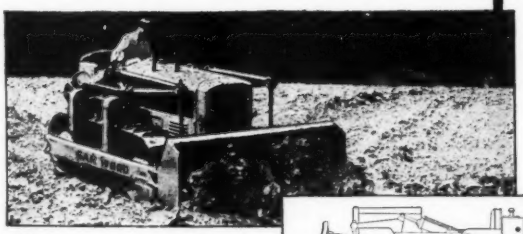


2A 4-wheel hydraulically operated Scrapers for earth moving, specifically constructed for fast digging, easy loading, accurate spreading.

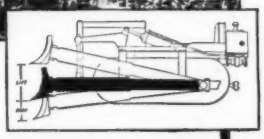


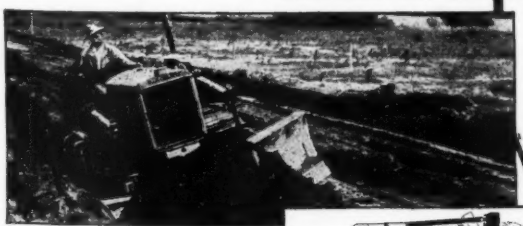
2B 4-wheel cable operated Scrapers for earth moving provide less power to load; greater clearance; flexibility for fast hauls; positive rolling ejection; precision spreading.

2C 2-wheel hydraulic Scrapers for low-cost, earth moving—dig, load, haul, back dump, make short turns.

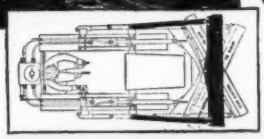


2D Bulldozer: Blade fixed for pushing loads ahead.





2E Roadbuilders: Blade set to push loads ahead, sidecast loads to left or right.

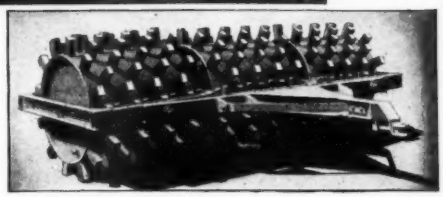


GAR WOOD Road Machinery

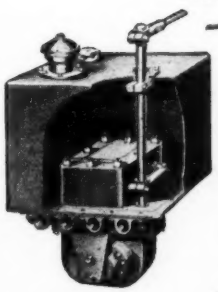
Gar Wood Industries, Inc., manufactures a complete line of heavy-duty, earth-moving machinery: two-wheel Hydraulic Scrapers in 3, 5, 6, and 8 cubic-yard capacities; four-wheel Hydraulic Scrapers in 8, 10, and 15 cubic-yard capacities; four-wheel Cable Scrapers in 11, 15, 20, and 25 cubic-yard capacities; Bulldozers; Roadbuilders; Tamping Rollers; Rippers. Accepted by leading contractors and governmental agencies throughout the world, as meeting all requirements for heavy earth-moving equipment.

Refer to picture number when ordering literature

2F Rippers rip compacted earth, shale, rock, roots, old pavements, old roads.

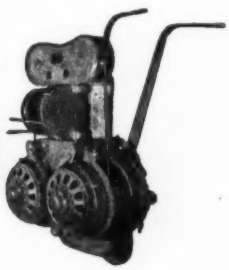


2G Sheep-foot Tamping Rollers built with interchangeable drums (single, double, triple).



2H Hydraulic Control Unit

2J Cable Control Single Drum.



2K Cable Control Double Drum

Hydraulic and Cable Control Units for operation of Scrapers, Bulldozers, Roadbuilders, Rippers, for heavy-duty service with track-type tractors.

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Need for Cut in Lumber Uses Weighed by WPB

FACED with an actual lumber shortage for the first time in its history, the government through the issuance of a WPB order has taken the initial step to bring lumber requirements within the limits of available supply.

According to WPB, in the three years from January 1, 1941, to January 1, 1944, lumber consumption amounted to 119,300,000,000 board feet. Production in that period totalled only 107,500,000,000 feet. To meet the excessive demands created by the war, 10,000,000,000 board feet were withdrawn from mill and distributors' stocks, and the supply was further augmented by imports, chiefly from Canada. Stocks are so badly depleted today that they can no longer bridge the gap between requirements and production. What is left in stocks is badly assorted as to grades, sizes and species demanded for war use.

Preliminary estimates of 1944 lumber requirements total 35,500,000,000 board feet against a presently anticipated production of 31,000,000,000 feet. The military services are reporting increasing difficulty in obtaining lumber to meet their direct war requirements, and shippers of war commodities are scrambling to obtain sufficient lumber to box, crate, block, and dunnage the materials of war. In a normal year, about 5,000,000,000 feet of lumber are used for shipping purposes. It is estimated that last year 16,000,000,000 feet were so used.

The critical lumber situation is expressed in depleted stocks, falling production, and increased demands. Shortage of manpower and equipment now make it impossible to harvest the logs and manufacture them at a rate sufficient to keep pace with demands.

WPB order L-335, issued March 22, required users of more than 50,000 board feet of lumber a quarter to file by April 25 statements of their needs for the second and third quarters of this year. These statements will be added to the direct needs of the military services, needs of approved construction programs, of small industrial consumers, and of farmers. If, as WPB expects, the total lumber needs exceed available supplies, it will be necessary to allot amounts of lumber to each of many end uses and to keep the total allotments within the supply limits. This doubtless will mean that certain lumber uses will be curtailed. Uses which require grades, species, and sizes not in great demand may be affected less than those which are competing with war demands. Otherwise, lumber users may expect to receive lumber in proportion to the essentiality of their products or uses of lumber to the war program.

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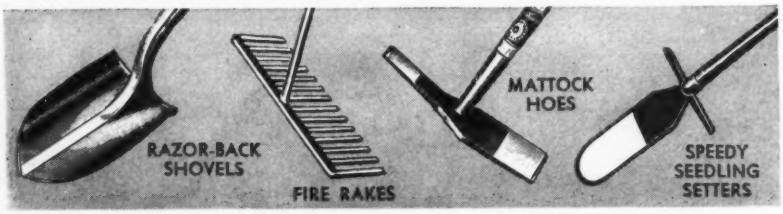

New FS Wildlife Chief

LLOYD W. SWIFT, native Californian and member of the U. S. Forest Service since 1928, has been named chief of the Forest Service Division of Wildlife Management, succeeding Dr. Homer L. Shantz who retired April 15. Assistant to Dr. Shantz for more than two years, Mr. Swift was previously in charge of wildlife management for the Forest Service Rocky Mountain region.

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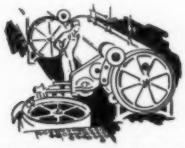
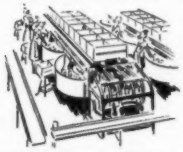
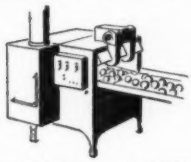


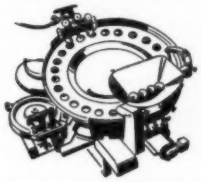
Anderson-Barngrover Division... Complete line of machinery for canning foods. San Jose, Calif.



Florida Division . . . Citrus and Vegetable Packing Equipment, and Food Protective Processes. Dunedin and Lakeland, Florida.



Texas Division . . . Protective Processes, Canning Machinery, Fruit and Vegetable Packing Equipment. Harlingen, Texas.



Sprague-Sells Division . . . Complete line of machinery for canning foods. Hoopeston, Illinois.

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Bean-Cutler Division. Sprayers, Dusters and Packing House Equipment for Fruits & Vegetables, Fog Fire Fighters, Turbine Pumps. San Jose, California.

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CONSERVATION IN CONGRESS

BETTER forest fire control was the promise written in the action of the Senate on April 24 approving House amendments to S. 45. This important bill which would amend the Clarke-McNary Act to increase the annual authorization for cooperative forest fire control with states and private timberland owners from $2,500,000 to $9,000,000, now goes to the President for signature.

Another important congressional action was passage by the House on April 20 of H. R. 3848. This measure provides for the continuation of the Forest Survey of the U. S. Forest Service by increasing the initial authorization of $3,000,000 to $6,500,000. The bill now goes to the Senate Agriculture and Forestry Committee for consideration.

A third important bill, S. 250, to authorize the Secretaries of Agriculture and Interior to enter into cooperative sustained yield agreements with owners of private and public timberlands, was signed by the President on March 29 and is now Public Law No. 273. It was passed by the Senate as amended by the House on March 22.

As amended by the House, S. 45 provides authorizations during the next four years as follows: fiscal year beginning July 1, 1944 — $6,300,000; fiscal year beginning July 1, 1945—$7,300,000; fiscal year beginning July 1, 1946—$8,300,000; and fiscal year beginning July 1, 1947—$9,000,000. Approval by the President will make it possible to include the $6,300,000 authorization for cooperative forest fire control in the Agriculture Department appropriations bill, H. R. 4443, now before the Senate Appropriations Agriculture Subcommittee.

H. R. 3848, as passed by the House, provides that the increased Forest Survey appropriations be expended at a rate not to exceed $1,000,000 in any one fiscal year. Of this amount, $750,000 will be available annually for extension of the Survey in territory not yet covered, and $250,000 for keeping Survey data current in regions already covered —the South, West Coast and Lake States. The initial Survey authorization of $3,000,000, established by Congress in 1928, is about exhausted.

The Cooperative Sustained Yield Units Act (S. 250), approved by the President on March 29, authorizes the Secretaries of Agriculture and Interior to enter into cooperative sustained yield agreements with owners of private and public timberland to establish sustained yield working circles around wood using industries that the combined forest crop may be so harvested as to stabilize local communities. Entrance by a cooperator into an agreement is purely voluntary. Timber in private or public ownership may be included with federally owned timber in the agreement, or the contract may be entirely confined to federally owned timber, depending upon timber ownership in the locality. Timberland included in an agreement will be subject to such methods of management as may be prescribed by the secretary of the department with whom the agreement is made. To assure cooperators full benefits of the agreement, and to guarantee continuity to the interested communities, federally owned timber may be sold without competitive bidding at prices not less than the appraised market value.

Amendments include authorizations for the administration of the Act to the extent of $150,000 for the Department of Agriculture and $50,000 for the Department of the Interior. Amendments proposed by Representative Francis Case, of South Dakota, and included in the Act, clarify the measure to the following extent: (1) Terms and conditions under which the cooperating private landowner may sell his timber will have no reference to the price of the stumpage; (2) Notice must be sent by registered mail to each landowner whose land is proposed to be included in a working circle prior to each public hearing on a new agreement; (3) Does not preclude further public hearing on a proposed agreement once the secretary has made his determination; and (4) Requires consent of Indians before agreements can be entered into on Indian lands.

The 1945 fiscal year Agriculture Department Appropriations Bill, H. R. 4443, passed the House on March 24 and has been sent to the Subcommittee of the Senate Agricultural Appropriations Committee.

The Forest Products Research item was increased $15,000 to a total of $1,092,519, to take care of research in the utilization of southern hardwoods. The House approved an appropriation of $40,000 to combat the spruce budworm in the states bordering Canada. Of this amount $30,000 is available to the Bureau of entomology and Plant Quarantine and $10,000 to the U. S. Forest Service.

The White Pine Blister Rust Control item remained at the budget estimate of $2,264,026, a slight increase over the current year. Gypsy and browntail moth control received $409,320 and Dutch Elm disease eradication $300,000.

_to WAR

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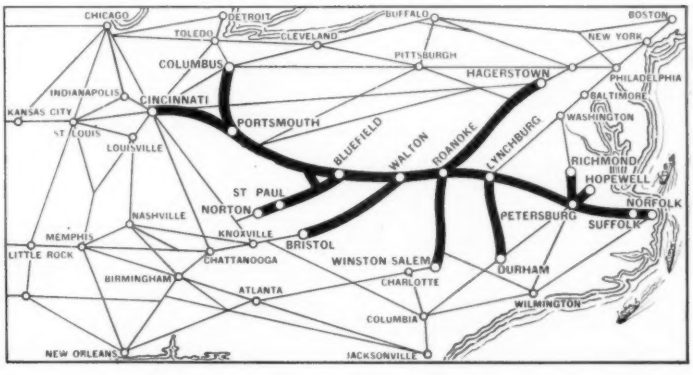
During an average year the N. & W. purchases approximately 25,000,000 board feet of Forest Products, consisting of cross, switch and bridge ties; timber and lumber; piling, posts, and poles. This is in addition to thousands of other smaller items made of wood.



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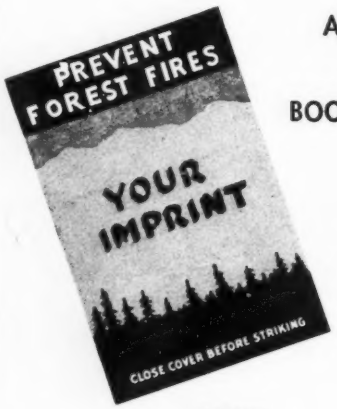

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A feature of the bill favorable to next year's control of the Dutch elm disease is an amendment modifying the current restriction against the use of federal funds in states which have not enacted laws requiring the owners of elm trees affected by the disease to remove and destroy them without expense to the federal government. The modifying amendment gives the Secretary of Agriculture certain discretionary powers in the application of federal funds as applied to the control programs worked out with the states. Forest pathology was decreased $9,400 from this fiscal year to $255,300. The Soil Conservation Service was reduced nearly $3,000,000 to a $29,637,000 total.

President Roosevelt signed the First Deficiency Appropriations Act (H. R. 4346) on April 1, and it is now Public Law No. 271. Appropriations totalling $1,680,000 were made available to the U. S. Forest Service for fighting forest fires ($1,535,000) and timber marking ($145,000) on national forests during the current fiscal year.

CONSERVATION CALENDAR

Important Bills in Congress With Action March 15-April 24, 1944

Bills Enacted

S. 250—McNary—To promote sustained-yield forest management. Passed Senate July 8, 1943. Amended and passed by the House March 21, 1944. Approved by the President March 29, 1944. Public Law No. 273.

H. R. 4346—Canon, Missouri—First Deficiency bill for the fiscal year ending June 30, 1944, and for prior fiscal years, etc. Passed House March 10, 1944. Amended and passed by the Senate March 28, 1944. Approved by the President April 1, 1944. Public Law No. 271.

Appropriations

H. R. 4443—Tarver—Making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1945. Passed House March 24, 1944. Referred to the Senate Committee on Appropriations March 28, 1944.

Fish and Wildlife

S. J. Res. 112—Bailey—Authorizing and directing the Fish and Wildlife Service of the Department of the Interior to conduct a survey of the marine and fresh water fishery resources of the United States, its territories and posses-

sions. Passed Senate March 14, 1944. Referred to the House Committee on the Merchant Marine and Fisheries March 15, 1944.

Forestry

S. 45—McNary—To further amend section 3 of Public Law No. 270, approved June 7, 1924 (Clarke-McNary), providing for forest perpetuation and extension, by increasing the annual authorization therefor and extending aid in combating tree insects and diseases. Passed Senate July 3, 1943. Amended and passed by the House April 20, 1944. Senate concurred in House amendment April 24, 1944.

National Monuments

S. 1819—Byrd—To repeal the Acts of August 15, 1935 and January 29, 1940, relating to the establishment of the Patrick Henry National Monument and the acquisition of the estate of Patrick Henry, in Charlotte County, Virginia. Introduced March 28, 1944 and referred to the Committee on Public Lands and Surveys.

H. R. 2241—Barrett—To abolish the Jackson Hole National Monument as created by Presidential Proclamation No. 2578, dated March 15, 1943, and to restore the area embraced within and constituting said monument to its status as part of the Teton National Forest. Introduced March 19, 1943. Reported with amendment (No. 1303) by the House Committee on the Public Lands March 28, 1944.

Research

H. R. 3848—Randolph—To amend section 9 of the act of May 22, 1928, authorizing and directing a national survey of forest resources. Passed House April 20, 1944. Referred to the Senate Committee on Agriculture and Forestry April 24, 1944.

Water and Stream Control

S. 1812—Clark, Missouri—Authorizing the construction of certain public works on rivers and harbors; authorizing investigations and measures for flood and sediment reduction on watersheds, through run-off and water-flow retardation and soil erosion prevention; providing for supervision by the Chief of Engineers of dams across navigable waters, and for other purposes. Introduced March 24, 1944. Referred to the Committee on Commerce.

H. R. 4485—Whittington—Authorizing the construction of certain public works on rivers and harbors for flood control. Reported without amendment (No. 1309) by the House Committee on Flood Control. March 29, 1944.

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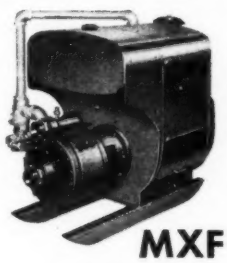

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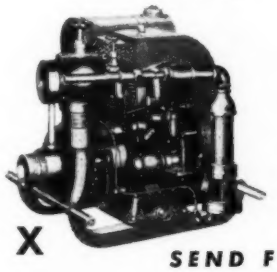

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Industrial Forestry

(*From page* 216)

tion with State Foresters and the Southern Pine Association, indicate that over 11,500,000 acres of industrially owned forest lands are being operated under management plans. This is only fifteen percent of the area under industrial ownership but it marks progress in the desired direction. Comparable management on all forest lands, regardless of ownership, is the goal whose achievement will bring a permanent forest economy to the South.

Opportunities to achieve this are written in the future. One of tremendous magnitude was keynoted by Donald M. Nelson, WPB chairman, in a recent address at Atlanta. Said Mr. Nelson: "It cannot be long before the forests of the South play their part in the expansion of the southern chemical industries." Another is the postwar reconstruction demand for lumber—for all forest products. If the South can meet this demand, foreseen by some as exceeding war requirements, without permanent injury to its growing stock, industrial forestry as a permanent paying enterprise will have arrived in the Piney Woods.

Uncle Sam

(*From page* 219)

because extension alone will not solve the problems arising from unwise forest cutting.

Fire control is already well on the way and the federal government is cooperating with all of the southern states in protecting private lands. In addition, of course, the national forests are well protected. Although steady progress has been made by the states, only forty-seven percent of the forest area has been brought under organized protection from fires. The financial contribution of the federal government has gradually increased. In fiscal year 1944, it is $1,054,497 in Region 8. Through increased funds from all sources, including private and county funds, as well as state and federal appropriations, it is hoped that in the not too distant future the whole of these forests will be reasonably well protected against fires.

The third large activity undertaken by the federal government in southern forests is the establishment of national forests. These federally acquired properties assure not only good cutting practices and fire control on the purchased lands but also watershed protection and the coordinated development of all forest resources. Furthermore, they advance forest development by demonstration and leadership in sound forest management and by providing constructive development of areas which otherwise would continue to depreciate in value.

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5-44

Three well stocked highly productive areas have been acquired as demonstrations, but by far the larger part of the national forests of the South embraces important watersheds or lands so depleted of timber or so poor that rehabilitation was too costly for private owners to undertake.

The acquisition of forest lands in the South for national forests has been going on for thirty years. At present they consist of a little over 9,000,000 acres. The program is still far from complete both because only about one-half of the forest lands within the boundaries of the present units have been acquired and because there are many other forest lands in the South where constructive development will be attained only through public ownership.

These national forests have a complete administrative organization and a system of roads and other improvements necessary for fire control. Timber stands are being brought up to full production by planting, proper cutting, and other silvicultural operations; and their other resources are being developed. Although most of the lands were cut over when acquired, their forest productivity has since been increased to a point where they are yielding this year 350,000,000 feet of wood, practically all of which is going into the war effort. This rate of cutting is considerably less than the current annual growth so that the lands are becoming more valuable as sustained yield producers of timber. Although the national forests of the South were not acquired to make money for the government, they more than paid their way last year and in the future should show larger profits.

The federal government also is carrying forward an extensive research program in southern forests from two experiment stations, one at New Orleans and the other at Asheville. Through field studies and experiments, these stations are solving many forest problems in connection with forest fires, timber growing, and utilization.

And now—why is Uncle Sam doing these things for southern forestry? What is his stake? Well, he has the financial strength to support the states in their efforts to provide prosperity through better managed forests. He can, should, and does cooperate because the country as a whole cannot be prosperous without a prosperous South. And, finally, he assists the South as a most important part of the forest problem of the whole nation because one-third of the area of the United States is forest land and the nation cannot be prosperous without this one-third contributing its full share of productive services.

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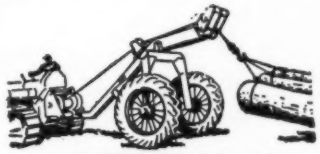

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Challenge to Research

(*From page* 236)

them are now bleaching sulphate pulp to make light colored, high-quality papers. A number are mixing small amounts of hardwood in with the pine; this practice, as it becomes more universal, will greatly increase the supply of usable pulpwood. Tests at the Forest Products Laboratory have indicated the practicability of a semichemical process to convert swamp blackgum, sweetgum, and other hardwoods into commercially usable pulps, used alone or in mixtures, for newsprint, corrugated board, and a variety of specialty products. Further research can undoubtedly develop processes which will transform the vast amounts of readily available low-grade hardwoods into useful pulp and paper products, and in so doing will make easier the forester's effort to improve stand quality and increase growth.

An important component of wood, comprising twenty to thirty percent of its weight, is lignin, the cementing material that binds the cellulose fibers together in the wood structure. In the chemical process of pulping wood, this material is dissolved and forms part of the waste liquors, which it often contributes to stream pollution problems. As a potential source of plastics and industrial chemicals, this waste lignin offers excellent possibilities for additional important industries for the South.

There are many other fields where research can improve the opportunities offered by the Piney Woods. In the field of forest management, landowners need to know when to cut and which trees should be removed and which left, to obtain maximum growth and financial returns; which trees are needed as a source of seed; how barren and open-grown areas can be brought to full productivity; how the more valuable species can be favored and the poorer ones eliminated; when and how to thin, prune and make improvement cuttings to best advantage; and many similar questions for each of many forest types and conditions, and with varying objectives of management in mind.

Also, a sound foundation in forest economics is needed to answer the timberland owner's question, "Where and when will it pay, and what must I do to make it pay?" Ninety-three percent of all the forest land in the South is in private ownership, representing hundreds of thousands of individuals, a big proportion of them farmers. Ninety-five percent of all southern sawmills

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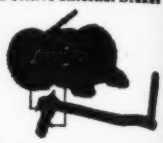
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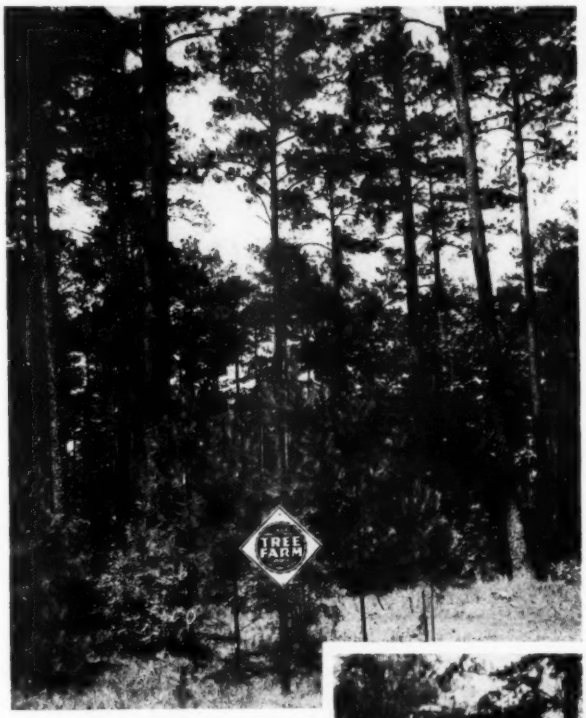

One of Frost's Tree Farms, showing both maturing and young growth trees.

Frost's first duty today is the production of lumber for war. To date its 9 big-mill operations in Louisiana, Arkansas, and Texas have furnished the Government a total of 220 million board feet.

When Victory has been achieved Frost's timber resources and productive capacity will revert to pursuits of peace. It is then that Frost's forward looking conservation practices, established many years ago, will serve the public well. Because, notwithstanding the inroads of war upon the South's timber supply, Frost has adhered consistently to selective harvesting, avoiding damage to young growth in felling trees, leaving at least two seed trees on every acre cut, maintaining fire wardens for every 15,000 acres, publicizing fire prevention methods by local newspaper advertising, clearing away tops, limbs and brush to reduce fire and insect hazard to remaining stands; promoting utilization by thinning stands, taking active part in the Tree Farm movement.

A typical growing crop of Frost Pine timber. In some areas up to seven crops have been harvested from the same land.

Germany is reported to have devastated its famous perpetual forests to supply its devouring war machine. Not so America. Here, the lumber industry supplies Uncle Sam's military might from matured trees, but safeguards young trees for tomorrow. Major factors in the southern pine region, Frost's forests *are extensive and will continue to be*, because Frost is maintaining them by growing recurring timber crops . . . to be harvested as they mature . . . to be protected for perpetual maturities.

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are small affairs producing less than 5,000,000 feet a year, yet in the aggregate they account for more than sixty percent of the entire lumber output of the region. These small landowners and operators are confronted with many economic and silvicultural problems that can best be answered by forest research, a job which they cannot undertake on their individual holdings, and which is therefore a responsibility of public agencies.

Nature has endowed the Piney Woods region with advantages for timber growing exceeding those of most other sections of the country. Here, soil and climate favor rapid tree growth; native to the region are numerous valuable hardwoods and softwoods; logging operations are relatively simple; all parts of the region are easily accessible to good rail and water transportation facilities; markets for forest products are generally good; ample labor is at hand; industrial development is well under way. Southern forests comprise forty percent of the commercial forest area of the United States and potentially are capable of supplying the nation with half of its future timber needs. The country's total output of turpentine and rosin, so important to the war effort, is a 100 percent southern pine product. Southern forests also support an important range livestock industry.

The Piney Woods stand on the threshold of an era of increased industrial development which will bring with it greater security and prosperity to its people. This development will necessitate a large and continuous supply of forest raw materials. The public has a stake in seeing that this valuable resource is grown and that it is wisely utilized, so as to contribute to the greatest good of all the people and provide an abundance of wood for future generations of Americans. The opportunity is here—*make way for the Piney Woods!*

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WARREN AXE & TOOL CO., Warren, Penna.
SAGER AXES AND BULL DOG LOGGING TOOLS—KNOWN FROM COAST TO COAST

THE URANIA LUMBER CO., LTD.

URANIA, LOUISIANA

MANUFACTURERS OF

Yellow Pine and Hard Woods—
Railroad Construction and Car Material
Long and Heavy Joists and Timbers

Urania Lumber now being produced for the war needs of America has the same features of quality and careful manufacture which have made it the preferred lumber of dealers, builders and industrial users for the past 48 years.

The greater part of our output today is going to Uncle Sam to help win the war; also we are trying to supply our regular customers' needs insofar as Government orders will allow.

We are able to supply much needed timber for the War effort, because this forty-eight year old company has been timber cropping its lands for nearly thirty years. As an example of our sustained yield program of continuous timber production we purchased in 1904 a sixty acre plot of land which in 1942 was set aside as a memorial to our late Vice-President, G. M. Tannehill. Selective cutting on this plot has yielded an average of 5,000 feet to the acre and the same amount of timber now remains for future growth.

Tree Farmers and Lumber Manufacturers
Members S. P. A., S. P. I. B.
Southern Hardwood Producers

The

A. B. Carroll
LUMBER COMPANY

Hurtsboro, Alabama

MANUFACTURERS OF

PINE LUMBER

The policy of our Company is to administer its lands under a management plan, to insure our customers a continuous supply of timber products which will make for permanency in the local forest communities. We are busy growing trees for the Nation's need today and tomorrow.

Producers of Logs for Liberty

MILLS AT HURTSBORO, ALABAMA, AND PITTSVIEW, ALABAMA

On The Seaboard Air Line Railway

Remember the Men Who Are Fighting For You

Nothing we can do at home can fully repay the debt we owe to them. But we can . . .
BUY WAR BONDS!

Cattle in the Pines

(*From page* 239)

Cattlemen's Association in Louisiana, has gone so far as to offer "$100 reward to anyone furnishing information leading to the arrest and conviction of any person maliciously causing a forest fire" in the parish. Stockmen who oppose promiscuous burning feel that it thins the stand of forage, may lead to serious erosion, and actually removes plant material needed by cattle for winter roughage. The Louisiana study further showed that most of the farmers who are convinced of the wisdom of protection from promiscuous burning live within the sphere of influence of action or educational programs—a welcome result of the long effort to reduce man-caused forest fires in the South!

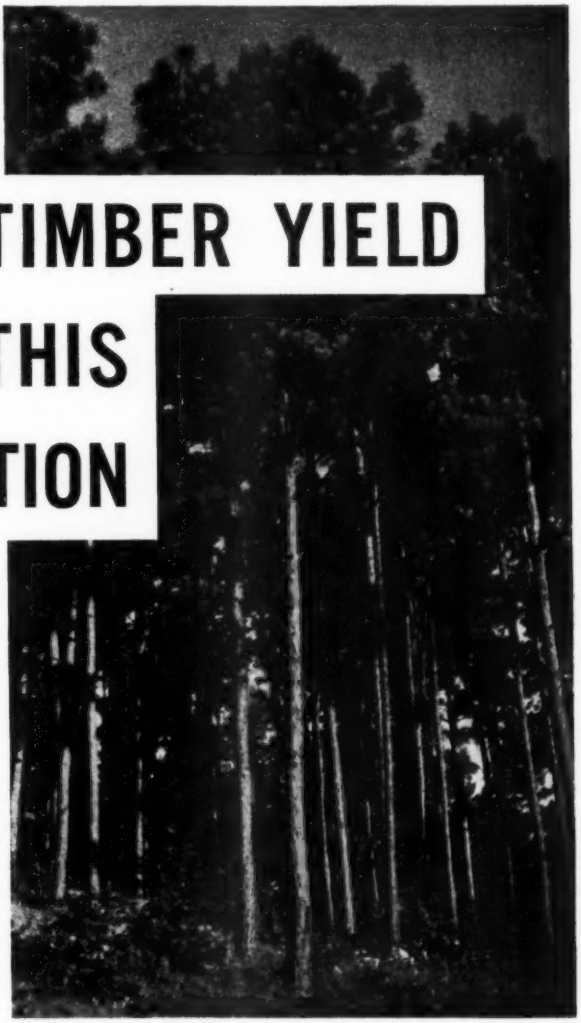
In contrast to the adverse reaction to indiscriminate burning, stockmen and many foresters alike have come to the practice of carefully prescribed burning in the longleaf type to reduce the "rough" and remove excess fire hazard as well as to improve the grazing. In a cooperative study at Tifton, Georgia, the forage on burned wiregrass range made earlier growth, was more nutritious and palatable, the yield was slightly higher, and cattle made better gains than on unburned range.

On the other hand, research in the reed forage type in North Carolina is indicating that fire can be of no particular use as far as grazing is concerned. The grazing capacity is reduced and the season for grazing shortened.

The Coastal Plain forest range offers such a cheap source of forage as to warrant careful evaluation of the season when the various types have their highest grazing values. The season when the range can furnish satisfactory nutrition is a guide to the development of more costly improved pastures and feed crops for carrying the cattle in good productive condition through the rest of the year. The problem is complicated, however, by the many types of forage and the literally hundreds of plant species with some grazing value. Studies to date indicate that cattle will usually do well on the wiregrass or three-awn type in spring and early summer when it is green, but they merely maintain body weight in the fall after the plants have grown up coarse and tough. In

H. M. SPAIN & CO.
COMMERCIAL FORESTERS
COMMERCE TITLE BUILDING
MEMPHIS, TENN.

SUSTAINED TIMBER YIELD PERPETUATES THIS PIONEER OPERATION



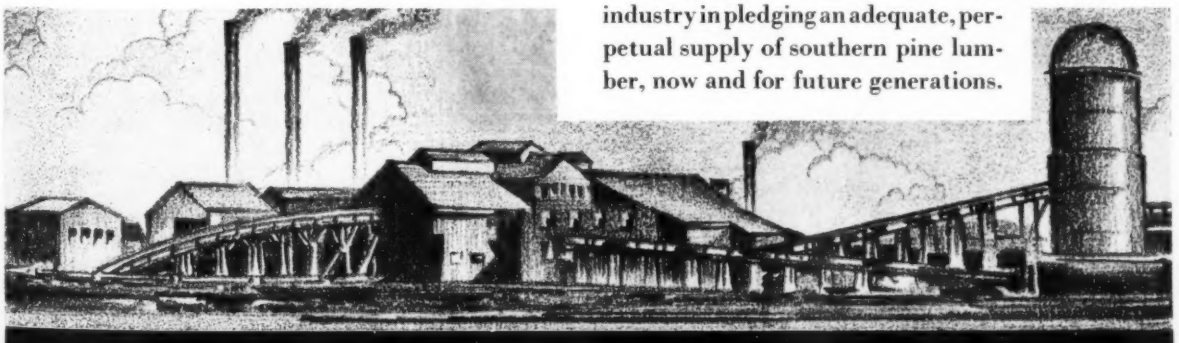
We have been converting southern pine timber into quality lumber since 1890. We expect to be doing the same from the same lands in 1990 and thereafter, under our long-range program of conservation and reforestation.

This program, set up and inaugurated in collaboration with state and federal foresters, is based upon our holdings of forest lands which are sufficiently extensive to provide recurring growth at a rate that more than supplies our mill production.

Inherent in this program are selective cutting, protection of new and maturing growth during logging operations, a patrol system that guards against fire, pests and damage from live stock, clearing woods of tops, waste and brush, and promoting new growth by leaving seed trees on each acre as cut.

Saw logs of the future now growing to maturity

Today, more than a half century since we began operations, we are supplying the Government with a huge volume of lumber for war. Tomorrow that volume will revert to the peacetime needs of home builders and industry. By these tokens we join with the progressive lumbermen of our industry in pledging an adequate, perpetual supply of southern pine lumber, now and for future generations.



Southern Pine Lumber Company

TEXARKANA, TEXAS

WOOD ENGINEERING... BY —BRUCE—

The name Bruce on a wood product is evidence of sound engineering and technical skill. It is a certificate of satisfactory performance—a guarantee of quality.

This we state with assurance, for nowhere will you find a greater assemblage of wood engineering talent. Over 30 years' experience in wood design, fabrication and treatment have taught us how to eliminate the guesswork in the manufacture of wood products. Long before a "Bruce-made" product comes off the line it has been engineered by expert technicians who have determined the method of machining and the kind of finish required to produce a superior product. It is this exposure to skill and knowledge that predetermines product quality even before it comes into being.

If you are familiar with Bruce Streamline Flooring, Block Flooring, Furniture Parts, Wood Boxes or Bruce Prefabricated Houses—you will know what "wood engineering by Bruce" really means.

E. L. BRUCE CO. BRUCE **MEMPHIS, TENN.**

Seven Plants:

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Carelessness starts more than 210,000 forest fires in the United States every year. *These poster stamps will help* spread the message of forest fire prevention. Each stamp beautifully printed in 4-colors. They are ideal for use on letterheads and envelopes, and each sheet used will mean that 100 individuals have been appealed to directly in the immediate fight to stop forest fires before they start.

Available in sheets of 100 at $1 a sheet.

The American Forestry Association
919 17th Street, N. W. Washington 6, D. C.

the winter grazing on this type, without concentrated supplements, results in high starvation losses and low calf crops.

Areas supporting broomsedges or bluestems and carpet grass, in addition to wiregrass, can be used in spring, summer and early fall. Other types, particularly in marshes and the Mississippi Delta, are best for winter, while still others with a good variety of sandy ridges, bottomlands and swamps may be grazed practically all year if supplemented for a short winter period with concentrated feeds.

Chemical analyses show the native forage in nearly every state from North Carolina to Texas to be deficient in certain essential nutrients during most of the year. Protein, phosphorus, calcium and other essential minerals are inadequate to maintain even dry cows, and are far below that needed by cows nursing calves, and by growing animals.

Based on research already done, it appears that minerals and concentrated protein feeds as supplements to the range should go far to attain better forage utilization, reduce death losses, increase the calf crop, the weight, condition and market value of calves at selling time, and step up the rate of growth and development in young animals. Costs would be far less than the increased returns. Cattle on typical flatwoods, for example, fed a supplement of two pounds of cottonseed meal a day from October 15 to December 10, gained an average of twenty-four pounds a head. In contrast, animals on similar range but without protein supplements, averaged a loss of forty-four pounds a head, a net difference of sixty-eight pounds.

Good forest management makes more problems for the grazer. Ample palatable grasses will grow on clearcut or partially restocked land, but profitable grazing management under a fully stocked forest is quite a different matter. This is due to the gradual diminution in the amount and perhaps quality of forage resulting from shading out by trees. Farmers in the Louisiana forest grazing survey estimated an average reduction of two and a half percent a year in grazing capacity as the canopy of a fully stocked stand closed over. However, there will always be openings in any well-managed forest, occurring both naturally and through cuttings. Also wide fire lanes, perhaps seeded to improved pasture grasses, will furnish a continuous base on which to carry a permanent herd.

The growing of pedigreed beef animals in the South, mainly on farms, is constantly expanding. The greatest stimulus in bringing this about was the eradication of the cattle fever tick. This has made possible the successful use of

". . . for your fine achievement in the production of war equipment."

TIMBER RESOURCES

TIMBER HUSBANDRY is not just a phrase or a theorist's dream. Practical, hardheaded business men, men with vision, and men with the courage to back their judgment have demonstrated, in the comparatively short time of a generation that, timber, one of America's greatest natural resources, can be protected and replaced. Other great natural resources such as coal, oil and minerals, when taken from place, are depleted for any reasonable hope of replacement. The thought of many early lumbermen, was to cut, slash, destroy, and abandon the land to erosion or whatever unkind fate might befall it. Even before the present war so forcibly demonstrated how important, and irreplaceable, timber and its products are, foresighted timberland owners began the conservation, and through practical methods of operation, the replacement of one of the greatest of our natural assets.

Timber and its products are not only cheap, practical construction materials, but they enter into the very fabric of every American home, not only as shelter, but as our great newspapers, magazines, books, furniture and finish, and they are also a vital factor in the sturdier jobs of transportation, shipbuilding, airplanes and many other important uses.

Nature's rigid rule of reproduction, if permitted and aided, will continue to supply us with the sinews of war and the pleasures of peace.

We are devoting a substantial part of our income to protecting the timberlands we own and promoting a perpetual supply of one of the resources that has made, and will continue to

MAKE AMERICA GREAT

TEXAS LONG LEAF LUMBER CO.

TRINITY, TEXAS

MANUFACTURERS OF

YELLOW PINE AND SOUTHERN HARDWOODS

THE SOUTH IS BACKING UP THE FOREST RESOURCE APPRAISAL OF The American Forestry Association

As of April 10, the list of contributors to the Forest Resource Appraisal of The American Forestry Association includes 18 Conservation and Trade Associations; 86 Industrial Companies; and 303 Individuals. A few of the contributors from the South are:

ASSOCIATIONS

Association of American Railroads
Macon Chamber of Commerce
Mississippi Forestry and Chemurgic Association
Southern Hardwood Producers, Inc.
Southern Pine Association

INDUSTRIAL

W. P. Brown & Sons Lumber Company
The Champion Paper & Fibre Company
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Chickasaw Wood Products Company
Container Corporation of America
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This important undertaking is a joint responsibility of all conservation interests—public and private alike. It is the most important conservation job that needs doing today.

Additional underwriting is necessary. The goal is $250,000—four-fifths of which has now been subscribed. We invite your help in completing the financing. Do it now with a cash contribution, a pledge, or, as a number have done, buy a Series F or G War Bond in the name of The American Forestry Association and mail it to us.

THE AMERICAN FORESTRY ASSOCIATION
919 17th Street, N. W. Washington 6, D. C.

purebred bulls on forest range with an immediate benefit in number, size and quality of the calves. However, undernourished calves and yearlings on forest range still take on age without maturing all of their inherent beef-making characteristics. Moreover, such animals appear even more susceptible to disease and death than the native scrub stock which through 150 years has built up blood lines well adapted to survive in the struggle with hot, humid weather, ticks, lice and prolonged seasons of below-maintenance diet. Practical cattlemen are building good range herds by adding the better beef blood to their native stock.

The infusion of better blood into cattle herds on the southern forest range has caused owners to give the animals more feed and care in order to protect their investment. This means in general grazing the forest range for a shorter period, ordinarily from April to October; or with use of supplements, for a longer fall period. It means a great increase in improved pastures, hay and small grains. Shifts to more pastures and forage production would bring desirable diversifications in farming and greater returns from cultivated crops, livestock and trees.

As to the future, there is room for further expansion in livestock numbers—just as rapidly as farm production can provide sufficient fall and winter feed. Southern forest ranges are still stocked far below capacity for the season when forage is best—spring and summer. Yet the greatest opportunity for expanded production lies in growing more beef from the cattle now on farms and in the forest—a calf every year instead of biennially, 400-pound calves at eight months instead of 300-pound yearlings, and negligible death losses.

The South needs better range management. This will be brought about by establishing and reproducing better forage species, by adapting kinds and classes of animals to different types of forest range; by working out more definite seasons of forest grazing for the many different types to obtain maximum nutritional values; by arranging better distribution of animals over the range through well-placed fences, salt grounds and water developments; by grazing proper numbers of animals on the range to make full use of the forage without damage to tree seedlings and soil values.

In livestock management, the future will see more suitable animal breeds and strains developed for hot weather and low seasonal nutrition, and improvement in feeding methods. There will be more workable coordination with forest management—adapting grazing methods on cutover and restocking or planted lands as well as on fully stocked selectively cut

stands, to maintain both cattle and trees; solving the grazing-burning-fire hazard problem; finding fire lane treatments such as seeding, fertilizing, grazing and mowing; determining seasons and intensities of grazing to avoid serious damage to pine and hardwood reproduction; and fitting grazing into the rapidly expanding tree farm movement.

Among the things to come is rural progress generally—finding the rightful place of the one-family farm unit, either independently or in the plantation system, in livestock and tree growing; attaining better yearlong distribution of rural labor between crops, livestock and forest; providing more adequate diet—particularly more beef and milk—larger incomes and better living conditions.

Pathfinders

(*From page* 242)

establishing the first extension project in forestry in the South.

Mattoon was the first extension forestry specialist employed in the Department of Agriculture and from then on, particularly after the passage of the Clarke-McNary Law, he assisted in training men appointed in the states to conduct extension forestry programs.

He was at his best when assisting with a demonstration in the woods—pointing out to woodland owners the differences between species, giving them the simple elements of tree growth, and instructing them how to make improvement cuttings and thinnings, or how to estimate timber and market it to the best advantage.

In his many years of cordial and inspiring cooperation with foresters, county agents and woodland owners, he blazed a pathway for farm forestry and won marked distinction in this field. No other man has made a greater contribution to its progress in the South than W. R. Mattoon.

The Fire Scourge

(*From page* 229)

subject of controlled ("prescribed") burning is too complicated for treatment here. It is simple in theory but difficult in practice, and it has little in common with the broadcast burning so widespread throughout the Piney Woods today.

If we were to measure progress in fire control solely by analysis of the statistics, the answer to the question "Can the South conquer the fire scourge?" could not be unqualifiedly affirmative. The job is overwhelming in its size and complexity and only a beginning has been made. Thousands of forest owners who would grow timber are prevented from

ATTENTION!

All Woodland Owners!

WE URGE ALL TIMBER LAND OWNERS TO HELP WIN THE WAR BY:

1. Helping to prevent forest fires and by writing your Congressional and State officials to support all measures for increased appropriations for forest fire work.
2. Have your timber marked for selective cutting so as to produce a greater yield on the timber land and a greater profit to yourself.

NORTH CAROLINA PULP CO.

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Bleached and Unbleached Sulphate Pulps
Specialty Boards and Paper

PLYMOUTH, N. C.

KNOWING YOUR TREES

By G. H. COLLINGWOOD

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Contains more than one hundred important American trees. Actual photographs of all trees, their leaf, bark, flower, and fruit, along with descriptions of their range, habits, uses and identifying characteristics, make this the outstanding tree book of today.

The oaks, the pines, the maples, the firs, the poplars, the hemlocks, the dogwoods, the spruces—these are but a few of the tree families included.

Cloth Bound, size 12 x 8¾ inches. *216 pages.*

THE AMERICAN FORESTRY ASSOCIATION

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LOUISIANA
LONG LEAF
LUMBER CO.

FISHER, LOUISIANA

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Operating on
Sustained Yield

PEAVY-WILSON
LUMBER COMPANY
Incorporated

HOLOPAW, FLORIDA

MANUFACTURERS OF

VIRGIN LONG LEAF
FLORIDA DENSE PINE
AND
RED CYPRESS

WE are using every effort toward growing more and better timber on our own land, as well as on land owned by others in this area.

OZAN LUMBER
COMPANY
Prescott - - Arkansas

L. N. DANTZLER
LUMBER COMPANY

(INCORPORATED
IN 1888)

MOSS POINT, MISSISSIPPI

doing so by obstacles beyond their control—and the greatest of these obstacles is uncontrolled fire. There are, however, some powerful forces at work which the statistics do not reflect. That part of the public represented by legislators, county officials, judges, editors, and others is becoming deeply concerned. They are willing to help and they want results. The public agencies, whose responsibility it is to lead and direct, have a better understanding of what is needed and what must be done. The preliminaries are over and the main bout is ready to begin. The next decade should be one of great achievements in the field of forest fire control in the Piney Woods.

Southern Pine—Farm Crop

(*From page* 231)

It is not to be expected that all timber operators immediately welcome planned cutting, considering the freedom that has existed heretofore. Usually one or more within hauling distance will bid on marked timber; and where operators are shy, it is not so much opposition to marked tree cutting as it is the fear of stumpage costing more as a result of it.

Where timber buyers do actively promote selective cutting, the woodland management situation has been known to brighten up like a dim room when light is turned on. Here is the goal which is sought. It calls for hard, patient efforts in the democratic tradition. The vicious circle of a minor number of shortsighted landowners and land-skinning operators, some think, may eventually call for locally administered rules to prevent cutting of undersize timber in some districts.

When owners have timber management demonstrated in their own woods they soon see the relation to other farming principles. A North Carolina farmer said: "We thin corn and chop cotton, why not thin our pines?" An Alabama farmer made this observation: "When I get a pig up to where he has a good frame on him, I know it pays to fill him out. It's the same idea with a twelve-inch pine."

The impression should not be gained that forestry is catching on in the Piney Woods only where foresters are contacting landowners. Publicity gets around, and some landowners make their own decisions. Recently a man interested in buying cutover land went into a county which did not have organized fire protection, or much forestry promotion of any kind. He thought he would find plenty of land at a reasonable price, but after visiting a number of places he became discouraged. The owners had already made up their minds to hold their

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for the

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While the entire output of our mills is being channelled into the needs for war, ANGELINA'S famous "Sudden Service" will be ready to supply the finest quality of Southern Yellow Pine for domestic and foreign postwar rehabilitation.

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Manufacturers of "Quality" Lumber for More Than Half a Century

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Pioneers in reforestation for perpetual forests, manufacturers of long-leaf and short-leaf yellow pine lumber and timber, wirebound shipping containers and creosoted poles, piling and lumber.

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By OVID BUTLER

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AMERICAN CONSERVATION is the story of America—its land, its resources, its people. Beginning with the story of the ages, this book presents for your knowledge and enjoyment the complete story of conservation of the organic natural resources of our country. Briefly told, with more than 200 illustrations, it is a story every American should read.

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THE AMERICAN FORESTRY ASSOCIATION

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lands for successive timber crops, feeling that to do so would prove more profitable than some of their past farming activities. All wanted organized fire protection. They had no cutting system other than a ten or twelve-inch diameter limit, which was the best they knew. Think of the fertile field among such owners!

Educational agencies are stressing more and more the importance of using farm labor in the marketing of timber. Best results are being obtained in pulpwood marketing, as pulpwood cut and placed for trucking brings two or three times as much as stumpage. With saw-timber the proposition is not always attractive, sometimes not at all practical.

Millions of acres in the aggregate of so-called woodlands have inferior trees, open places, or just brush, and will grow little besides fuelwood unless fast-growing pines are established. These sorry areas are mostly in small patches intermingled with good woodland or farm land, and would seem predominantly to call for a solution through private ownership. Rehabilitation measures deserve attention as a big-league problem along with fire control and proper cutting. The job is not an easy one, and for the owner returns are long deferred. Because of the public's stake in having a reserve of timber, it should probably help landowners with the cost of re-stocking. Research, educational emphasis, greater distribution of seedlings, fire control, and conservation payments are all weapons with which to attack this problem.

Markets for small or non-salable hardwoods must be developed to realize intensive farm forestry where undesirable hardwoods compete vigorously on pine sites. Millions of cords now clutter the woods. Foresters are looking hopefully to the pulp and chemical industries.

The Webb Brothers of Perry County, Alabama, operate a 20,000-acre farm which includes 10,000 acres of woods. They follow a sustained yield plan, and get out over 1,500,000 feet yearly with farm labor. Said Jake Webb this year, "My sister keeps the books on all our farming work. She doesn't know much about growing cotton, cattle, potatoes, corn, or timber, but she does know the money figures—the costs and the returns—and she keeps telling us we get the most clear income from the beef cattle and the timber."

Small owners as well as the large ones in the South are becoming convinced that growing crops of timber will pay. This is perhaps the most basic factor behind all of the encouraging forestry activities that are in motion. Continuance of good demand for timber, together with encouragement from the public and industry, will assure ever-increasing yields of timber from farm woodlands.

THE CONTAINER IS AS ESSENTIAL AS ITS CONTENTS

Looking beyond the Horizon

Ever mindful of the war job we have to perform—the production of urgently needed containers which carry supplies to the battlefronts—we have not lost sight of the fact that the wise use of our forest resources is essential to sustained prosperity and general welfare.

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At the present time our production is devoted almost entirely to the War effort, but when Victory is achieved we will be ready to serve you.

DENKMANN LUMBER COMPANY
CANTON — MISSISSIPPI

Small Sawmills

(*From page* 233)

not exceeding 5,000 acres in extent, and the bulk of this land is in ownerships of less than 500 acres. This means that small sawmill operators, owning relatively little forest land, obtain their timber from hundreds of thousands of small owners, such as farmers or absentee owners, including lawyers, salesmen, bankers, doctors and widows. Timber growing has never been particularly attractive to these people, because the returns from one-cut, lump-sum sales to small sawmill operators have been too low. As a result, most of the second-growth forests of the South are cut too heavily and too soon, and their development for maximum production and income is effectively prevented.

Opportunities for improving this situation fall into two major categories: those concerned with the manufacture and sale of lumber and those concerned with the growing and marketing of timber products by small landowners.

At present the lumber industry in the South is made up of too many small-scale operations producing a low-quality product. Further refinement of the lumber is needed, and to accomplish this many of the roving commercial mills could be expanded into medium-sized stationary plants manufacturing all grades of kiln-dried lumber. Mechanically, such plants would be equipped with a circular or band saw capable of cutting from 1,000,000 to 3,000,000 feet a year, an edger, trimmer, dry kiln, and planing mill equipment. The resultant products could be sold for retail use without further processing and would be worth at least thirty percent more than rough green lumber. Additional earnings could be obtained through the sale of firewood or pulpwood derived from slabs and edgings—material which is usually left in the woods by portable mills. Furthermore, progress is being made in the use of mill waste, including sawdust and shavings, for the manufacture of industrial alcohol. Permanently located sawmills of the above type might provide a considerable part of the wood waste requirements of alcohol plants. A number of these better sawmills are already in operation, particularly in the coastal plain of the Carolinas, and their feasibility has been proved by practical experience.

Increased profits derived from making finished lumber and full utilization of waste would enable these operators to pay more for the small landowners' timber. This would create more interest on the part of landowners in the possibilities of growing timber as a crop. Mill men would be shortsighted, indeed,

if they did not attempt to capitalize on this increased owner-interest by developing continuous yields from the timberlands in their respective neighborhoods. In Arkansas, a mill operator has already demonstrated that small timberland owners can be organized into sustained yield units for the support of a local mill. As practiced there, he manages their timberlands for a maximum yield of all products and in return has the privilege of buying their sawlogs.

It should be emphasized again that the South is a region of small trees, small mills and small land ownerships. They present both a problem and an opportunity. Wood is one of the South's basic raw materials. The first crop is about gone, but now there is a new crop, and to harvest it a new type of industrialization has developed.

Will this small mill industry bring any more benefits to the people of the South than did the band mills of the past? Experience so far indicates that it will not. Properly used there will continue to be a place for many small mills and concentration yards in the lumber economy of the South, but there is a wonderful opportunity to develop a more stable industry using timber grown as a crop. If this can be brought about, the South will be able to capitalize more fully upon one of its priceless heritages—the forest resource.

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The formation of a new Corporation known as

PERPETUAL FORESTS, INC.

PERPETUAL FORESTS, INC. has been organized to manage the 250,000 acres of cutover lands formerly owned by Putnam Lumber Company of Shamrock, Florida, who have maintained private and State fire protection for the past ten years. Now as owner and operator of these lands, the new Company will intensify its forestry practices in order that a sustained yield of pulpwood and saw logs will be maintained at all times.

M. L. FLEISHEL, *President*

PERPETUAL FORESTS, INC.

SHAMROCK, FLORIDA

WE ARE GROWING TREES TO SERVE AMERICA TODAY AND TOMORROW

Your Invitation To Membership

IN THE

AMERICAN FORESTRY ASSOCIATION

TO provide a basis for informed postwar handling of one of the country's most important natural resources, The American Forestry Association on January 1 formally initiated a fact-finding survey to determine what effect the war is having upon the country's forests and forest lands and what will be their condition when the manifold problems of reconstruction are at hand. This important undertaking is known as the Forest Resource Appraisal.

Public-spirited citizens, industrialists and organizations alert to the need of forest conservation and development in postwar economy are making this survey possible by underwriting its estimated cost of $250,000.

Many other individuals and organizations are indirectly supporting this activity through membership in The American Forestry Association. We would welcome your participation in the important program of the Association, and for your convenience the various classes of membership are listed in the coupon below.

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WHO'S WHO

Among the Authors in this Issue

INMAN F. ELDREDGE (*This Is The Piney Woods*) is a native of the Piney Woods region—a South Carolinian by birth. A Biltmore man, he entered the Forest Service in 1905 and made it his career. He has held many important administrative posts and is now Regional Director of the Forest Survey of the South, stationed at New Orleans.

PINES AT WAR—written by representative men in the three leading branches of forest industry in the South—H. C. Berckes, of the Southern Pine Association for *Lumber;* Frank Heyward, of the Southern Pulpwood Conservation Association for *Pulpwood* and Harley Langdale, of the American Turpentine Farmers Association Cooperative for *Naval Stores.*

G. H. COLLINGWOOD (*Challenge, and Opportunity, for Industrial Forestry*), a Michigan forester, is one of the best known in the profession. Formerly Forester of The American Forestry Association, he is now Chief Forester and Assistant Secretary of the National Lumber Manufacturers Association.

JOSEPH C. KIRCHER (*Uncle Sam In The Piney Woods*), a Yale forester, class of '07, has been a member of the United States Forest Service since 1909. He is now Regional Forester for Region 8, with headquarters in Atlanta, Georgia.

H. A. SMITH (*State Forestry—Its Role in the Pinelands*), native Pennsylvanian and Mont Alto man, has—since his return from military service in World War I in 1919—concentrated in the state forest field. He has been State Forester of North Carolina and president of the Association of State Foresters, he is now with the Tennessee Valley Authority, stationed in Alabama.

JULIAN F. MCGOWIN, for the W. T. Smith Lumber Company; ERNEST KURTH, for The Angelina Lumber Company; EARL PORTER, for the International Paper Company and E. A. HALL, for the Container Corporation of America speak for their companies as master growers of pine in the South.

C. F. EVANS (*Can the South Conquer the Fire Scourge?*), a leader in his profession, has long been associated with forestry in the South. He is Assistant Regional Forester with the Forest Service at Atlanta.

CHARLES R. ROSS (*Southern Pine—Farm Crop With A Future*)—one of our younger foresters, is a North Carolinian. Formerly Extension Forester of Alabama, he has recently been appointed to the staff of the Forest Research Appraisal of The American Forestry Association as regional consultant for the Southeast.

JAMES W. CRUIKSHANK (*Small Sawmills*), of the U. S. Forest Service, is Regional Survey Director at the Appalachian Forest Experiment Station at Asheville, North Carolina.

E. L. DEMMON (*The Piney Woods' Challenge to Research*), is Director of the Southern Forest Experiment Station of the U. S. Forest Service at New Orleans.

JOHN B. WOODS (*The Forest Appraisal and the South*) heads up the work as Director of the Forest Research Appraisal of the A.F.A.

R. S. CAMPBELL (*Cattle In The Pines*) is attached to the Division of Range Research of the U.S.F.S., and his co-author—HAROLD H. BISWELL, conducts range investigations at the Appalachian Forest and Range Experiment Station at Asheville.

GEORGE H. HEPTING (*Littleleaf—A Pine Problem*) is a forest pathologist of the Bureau of Plant Pathology, U. S. Department of Agriculture.

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